American Gas Journal

JULY, 1958 | Only Magazine Edited Exclusively for the Gas Distribution Industry

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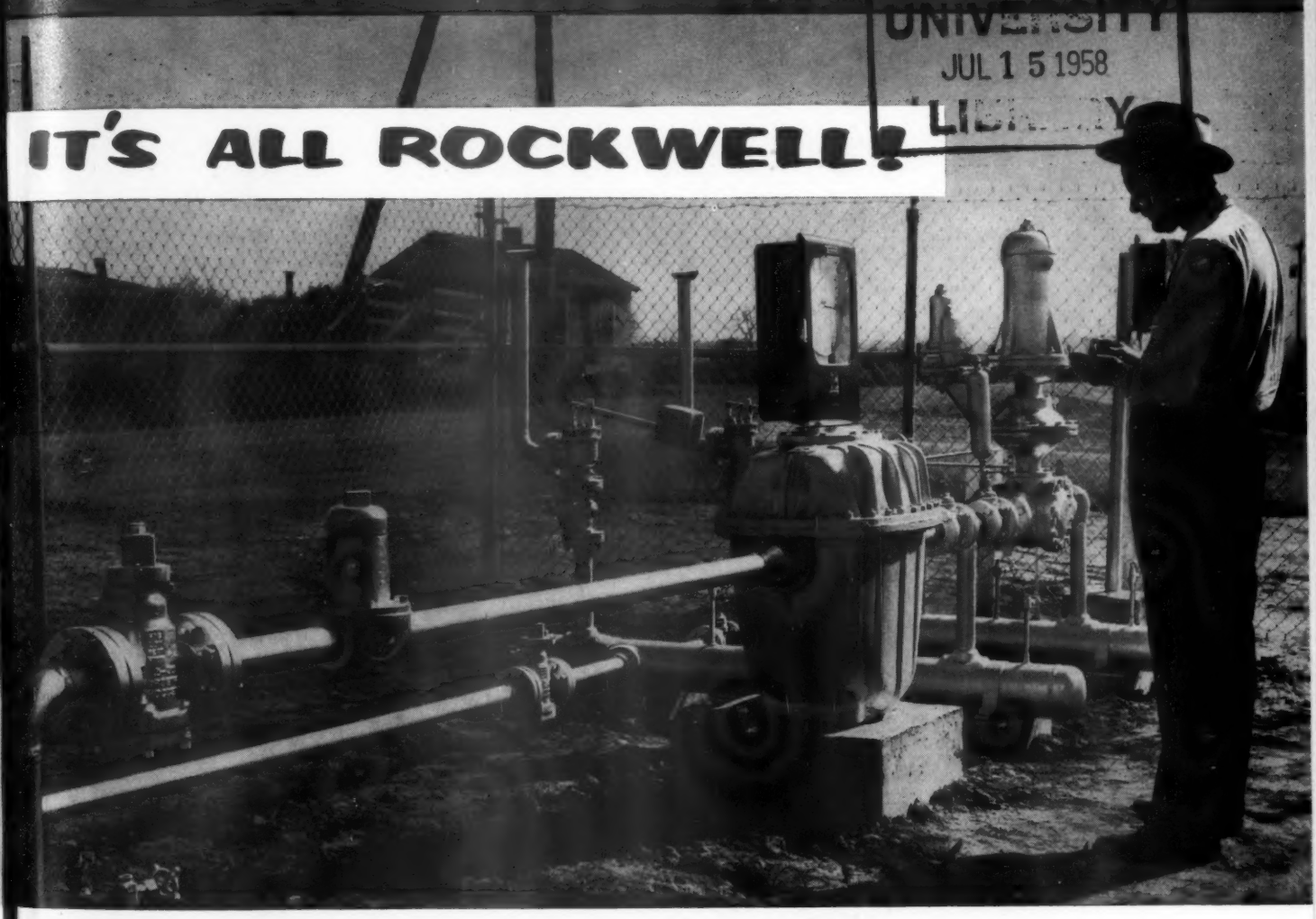

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American Gas Journal®

ONLY MAGAZINE EDITED EXCLUSIVELY FOR THE GAS DISTRIBUTION INDUSTRY

July, 1958 **100th Year of Publication** Vol. 185, No. 7

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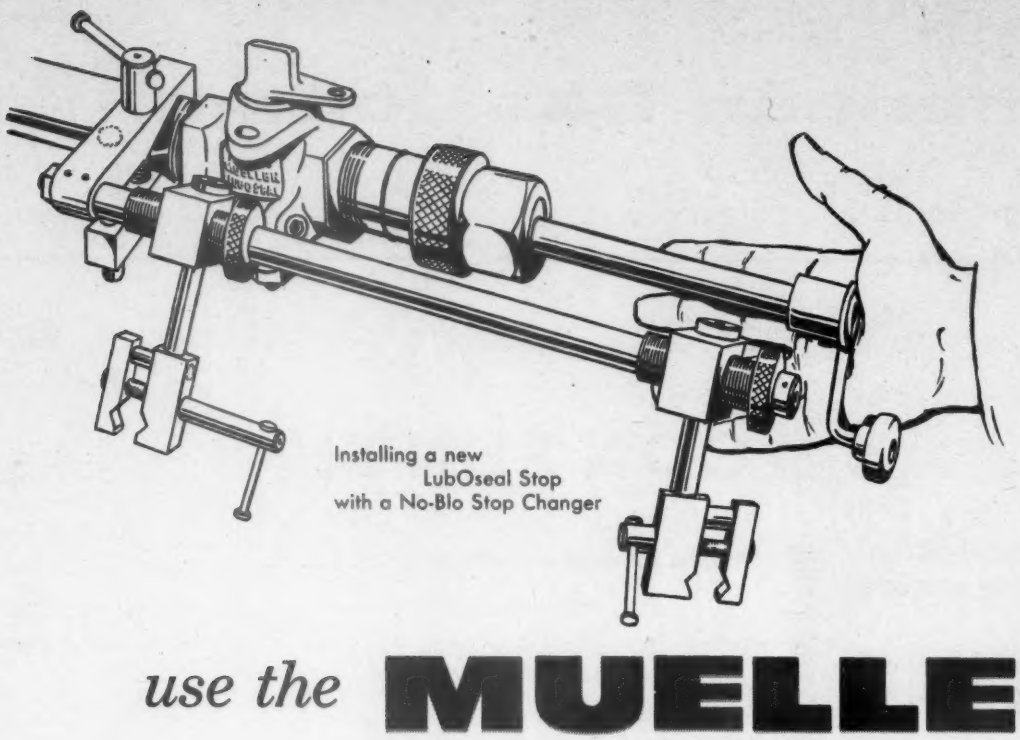

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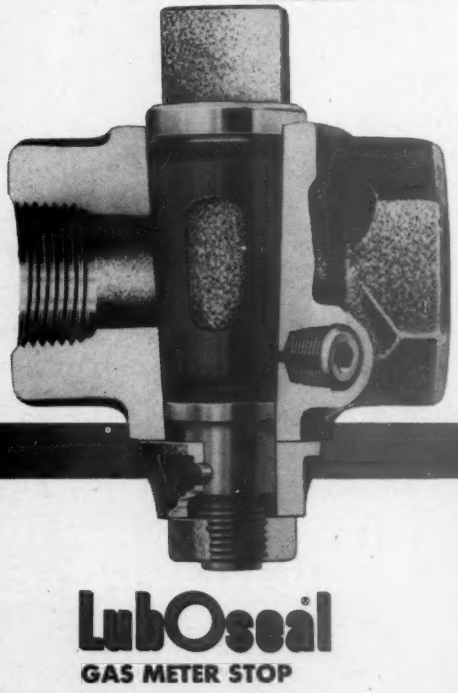

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American Gas Journal

Established July 1, 1859

•

Dean Hale
Editor
Pat Lear
Assistant Editor
Ernestine Adams
Economics and Management Editor
Donald M. Taylor
Gulf Coast Editor, JAckson 6-2631
2370 Rice Blvd., Room 110, Houston, Texas
Jan Craig
Editorial Production Manager
Donald D. Fickert
Presentation Editor
Lynn Patton
Editorial Assistant
Cecile Pincus
Editorial Assistant
Leo T. Parker
Contributing Editor

•

Joe B. Woods
President and Publisher
Abbott Sparks
Vice President and Advertising Director
Frank H. Love
Vice President
L. H. Johnston
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Advertising Service Manager
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Assistant Production Manager

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NEW YORK: **John Wallace**
Clyde Dillehay
52 Vanderbilt Ave., MUrray Hill 6-7232
CHICAGO: **E. V. Perkins**
John McDonald
53 West Jackson Blvd., HArrison 7-6883
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465 East Union, Pasadena, RYan 1-0685
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121 Ambleside Dr., WEllington 1-0619
BIRMINGHAM: **Fred W. Smith**
1201 Forest View Lane, Vesthaven, TRemont 1-5762
HOUSTON: **Jess Adkins**
2370 Rice Blvd., Room 110, JAckson 6-2631
DALLAS: **Ed Sealey**
800 Davis Bldg., RIverside 8-4403

Cable Address: PEPUB

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Printed in U.S.A.

Fuel for Thought

On the occasion of beginning our 100th year of service to the gas industry, it is interesting to recall editorial comments from some of the early issues of our predecessor, THE AMERICAN GAS LIGHT JOURNAL.

John B. Murray, the founder, commenting in the very first issue *(dated Friday, July 1, 1859)*, noted that at that time there were some 4000 gas-light companies in existence in the nation, "representing a gross capital of 50, perhaps, 55 millions of dollars." He further stated:

"That so large and diffusely scattered an interest should have been left till this day unrepresented by a paper of its own, is indeed surprising in this protective age . . ."

Murray, a Wall Street banker and head of a well-known investment house, originally planned to issue a private circular listing current prices of gas light company shares in the principal cities. Shortly after the announcement of these plans, he was prevailed upon by associates to expand its coverage to include all such American companies.

Murray acceded to these requests and soon a four-page letter was under preparation. Meanwhile, many firms who manufactured meters, retorts, gas burners, fixtures, etc., requested that the new "paper" be used as a medium of advertising their businesses to companies and individuals engaged in the manufacture and consumption of gas — providing them with a more direct means than any then existing.

Yielding to all of these suggestions, the first issue appeared on July 1, 1859, as a 16-page publication — the first ever to serve the gas industry.

In the first issue, Murray listed 183 gas light companies, representing an aggregate capital of $31,661,570. A year later, in the issue of July 16, 1860, a total of 423 companies were reported, 381 of them in the United States, 23 in Canada (then called the British Provinces of North America) and 19 in Cuba, Mexico, and South America.

The early issues of AMERICAN GAS LIGHT JOURNAL carried considerable technical information for gas men of that day, principally those concerned with building and operating gas-works, and for those men who tested meters. Quite a bit of information was also published on photometry and gas light design.

In December, 1860, the publication acquired its first, full-time editor, a Mr. C. Elton Buck, a well-educated scientist of his time. THE AMERICAN GAS LIGHT JOURNAL soon became the authority on all subjects concerned with the manufacture, distribution, and utilization of manufactured gas.

Reading through the early issues, one discovers that though times may have changed, circumstances have not changed as much. For instance, in the September 1, 1859 issue, Mr. Murray noted that there had been a "crisis" in the nation's economy in 1857 and many "prostrate months" in 1858, but during those trying times, the gas works and the gas light companies did very well.

We might note that, 100 years later, while the national economy is going through a period of "recession" or "adjustment," the gas industry is still doing very well, thank you. There's no recession in the gas industry.

This issue of AMERICAN GAS JOURNAL marks the start of our 100th year of continuous publication. As has been true of the past 99 years, the AMERICAN GAS JOURNAL will continue to follow the principles of its long standing thesis, that of chronicling the industry's events, informing its readers of the changing engineering and operating technology, and recording for posterity the industry's dynamic growth.

—The Editors

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variable pressure pilot

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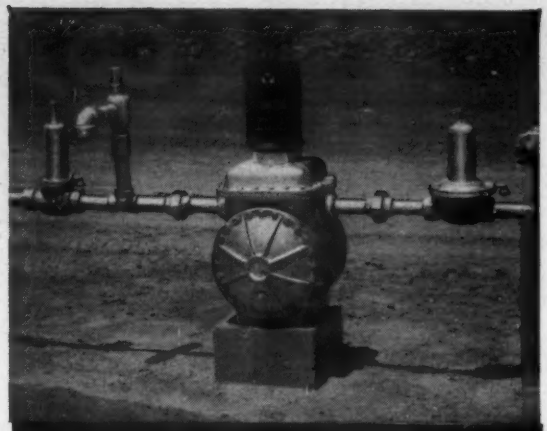
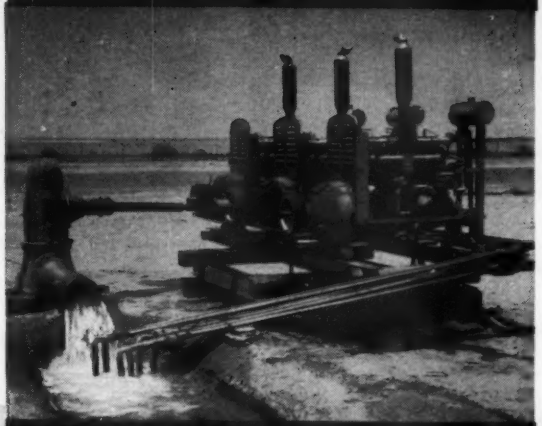


Base Pressure Index on American 25B Ironcase Meter, and Type HPR-10 and HPR-20 Reliance Regulators are installed at each well. Meter-regulator sets are standardized for maximum economy.



1,000 Gallons of Water a Minute are delivered by this triple-engine irrigation pump. Average pump delivers 2,000 gallons a minute and uses less than 1,500 cubic feet of gas an hour. Gas pressure is reduced to 6 oz. by regulators on engines.

35 Gallons of Water a Minute are delivered to irrigation rows through 2 inch plastic syphon tubes which draw water from drainage ditches.

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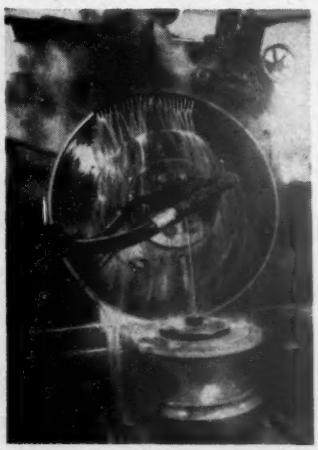

Wheel of plenty! Welding pipe by electric resistance weld process. Lone Star API pipe is fully normalized.

Joe Roughneck, of course, is symbolic of the men who have made the fabulous oil and gas industry tick . . and Lone Star Steel's huge completely integrated plant is right in the middle of Joe's workshop. Lone Star pipe is quality-controlled from mining of ore to finished pipe. In addition to operating day and night to supply Joe's pipe needs . . Lone Star has recently completed new and even larger facilities.

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Coming Events

IN THE GAS DISTRIBUTION INDUSTRY

July

18- Oklahoma Utilities Association accounting section conference, Ardmore Hotel, Ardmore, Oklahoma.

24-25 5th Annual Symposium on Computers and Data Processing, Albany Hotel, Denver, Colorado.

August

25-27 Appalachian Gas Measurement Short Course, University of West Virginia, Morgantown, West Virginia.

September

3- 5 PCGA annual convention, Benson and Multnomah Hotels, Portland, Oregon.

5 New Jersey Gas Association, annual meeting, Berkeley Carteret Hotel, Asbury Park, New Jersey.

11 NEGA safety conference, Sheraton Plaza, Boston, Massachusetts.

12 NEGA commercial industrial heating division, Wachusett Country Club, West Boylston, Massachusetts.

16-17 AGA 10th annual accident prevention conference, Sheraton-Seelbach Hotel, Louisville, Kentucky.

17-19 Southeastern Gas Association, annual meeting, Sir Walter Hotel, Raleigh, North Carolina.

19 Oklahoma Utilities Association gas division conference, Biltmore Hotel, Oklahoma City, Oklahoma.

October

9-10 National Noise Abatement Symposium, Hotel Sherman, Chicago, Illinois.

10 NEGA, heating group of C-H-I division, Publick House, Sturbridge, Massachusetts.

13-15 AGA, annual convention, Atlantic City, New Jersey.

15-17 Wisconsin Utilities Association electric and gas sales operating convention, Hotel Schroeder, Milwaukee, Wisconsin.

17 NEGA, industrial group of C-H-I division, Sheraton-Biltmore, Providence, Rhode Island.

20-24 National Safety Council, Chicago, Illinois.

20-24 NACE, annual conference and exhibition, south central region, Roosevelt Hotel, New Orleans.

21-22 Purchasing Workshop Conference, Illinois Institute of Technology, Chicago, Illinois.

22-24 Air Conditioning & Refrigeration Wholesalers, annual meeting, Sheraton-Palace Hotel, San Francisco, California.

24 Oklahoma Utilities Association accounting conference, Burlingame Hotel, Bartlesville, Oklahoma.

29-30 Computer Applications Symposium, sponsored by Armour Research Foundation, Morrison Hotel, Chicago, Illinois.

30 NEGA operating division, Sheraton-Kimball Hotel, Springfield, Massachusetts.

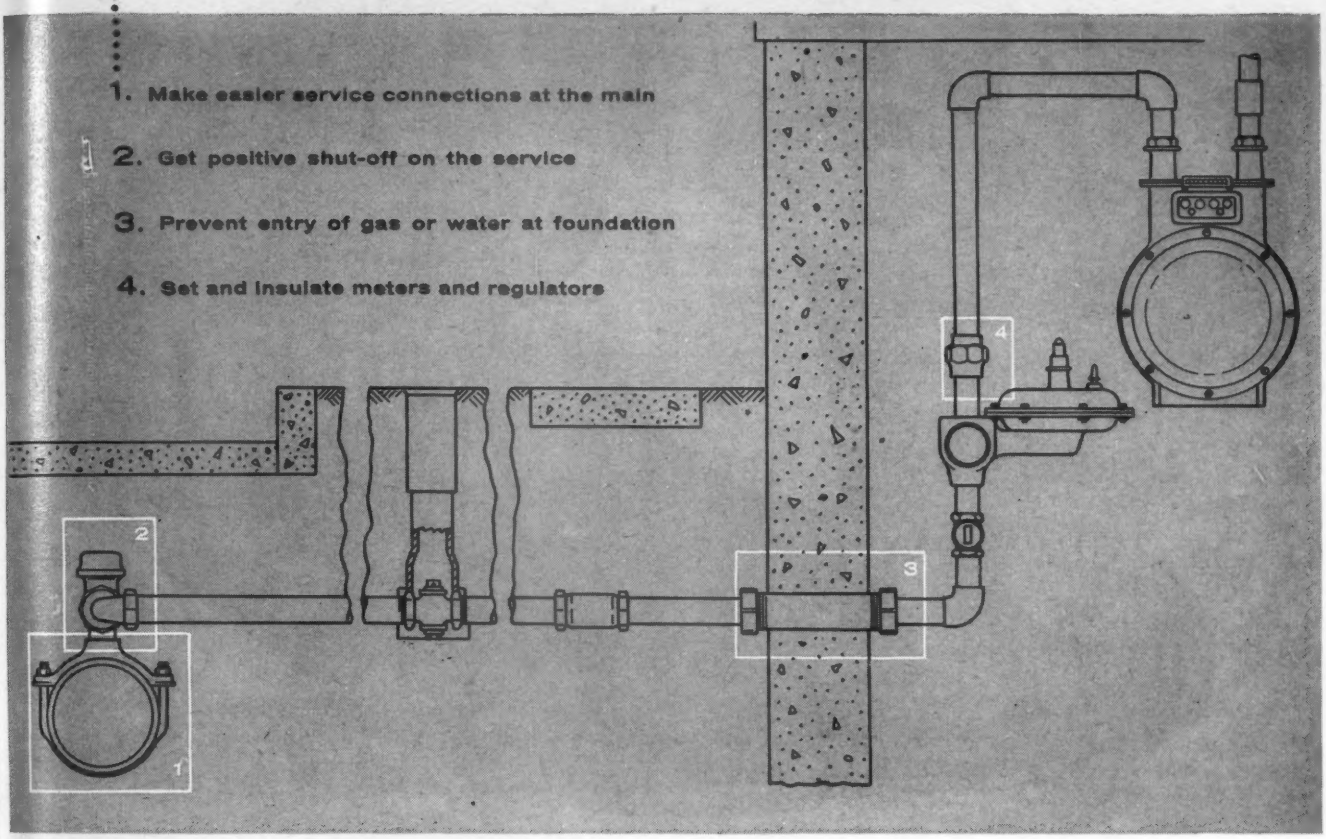
31 NEGA accounting division, Statler Hilton Hotel, Hartford, Connecticut.

November

17-19 National Fire Protection Association fall conference, Pittsburgh, Pennsylvania.

18-20 American Standards Association, Hotel Roosevelt, New York, New York.

Four ways to simplify service line installations:


1. Make easier service connections at the main
2. Get positive shut-off on the service
3. Prevent entry of gas or water at foundation
4. Set and insulate meters and regulators
1
2
3
4

1. Make service connections at the main

NEW STYLE 91 SERVICE SADDLE gives you a quicker way to make permanent connections on steel or cast-iron pipe. High tensile steel straps conform snugly to the outside of the pipe; broad bearing surface prevents cutting or crushing. Available with single or double strap, tap size up to 2-inches.

2. Get positive shut-off on the service

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3. Prevent entry of gas or water at foundation

NEW "WALL-SEAL"...a simple leak-proof method of sealing between the wall opening and service pipe. Simply use a threaded nipple . . . and two special Dresser compression follower nuts and wedge gaskets. Eliminates the aggravation of having to pack the space with tar, rags, etc.

4. Set meters and regulators

NEW INSULOK ADAPTER. . .insulates, simplifies and speeds setting of regulators and meters. Blocks harmful flow of current between house and main. Virtually tamperproof. Can be used practically anywhere on the riser, on the high or low-pressure side of regulator. . .indoors or out. Facilitates pre-make-up of the riser assembly in shop or truck.

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After our saddle has passed the soap and water test, it is shaped over a mandrel to a glove-like fit. The gasket is cemented in—no shifting during installation!

With its rugged malleable iron construction, its full-length hinge, its single over-sized plated bolt, it guarantees a sound installation. Our ideal is PERMANENCE. In design, in every step of testing, fitting and assembling, we never lose sight of that ideal. You can use the *SKinner-SEAL* Service Saddle with complete confidence.

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Mcf

Manufacturers of gas appliances of all types are being urged to exhibit their products in the National Housing Center in Washington, D. C. The Center, located in the new $2,500,000 home of the National Association of Home Builders, offers manufacturers an opportunity to take their message to more than 40,000 home builders in the U. S. Big block of space is being used by AGA for a unified gas exhibit and nearly 20 gas appliance manufacturers are participating in the exhibit. More are needed. With nearly 1,100,000 new homes to be built in 1958, gas appliance men should do everything possible to take their story to the home builders, AGA emphasizes.

Fuel oil opponents of the Texas-to-Florida natural gas pipeline had their day in court and were told by the Supreme Court that both gas and oil "are needed to serve the growing population and expanding economy of Florida." On that note, the highest court refused to disturb the FPC's approval of the 1500-mile pipeline system.

Nearing its 100th birthday, Portland Gas & Coke Company plans to change its name to *Northwest Natural Gas Company*. The new name, points out C. H. Gueffroy, president, is more fitting and indicative of the area served by the Oregon company. The firm, which will observe its centennial in 1959, has a service area extending 120 miles south and 80 miles east of Portland, as well as serving Clark County, Washington, which includes the city of Vancouver.

Study in Contrasts. In early May, 43 Alabama city and gas district representatives met in Montgomery to draft long range plans for a campaign against increasing gas rates. The group expressed belief that most of the responsibility for such increasing gas rates "rests with the Federal Power Commission," and noted that the FPC was failing to use tools given it under the Natural Gas Act to control prices at the wellhead.

So . . .

In early June, directors of the Southeast Alabama Gas District, meeting in Andalusia, approved a 10 percent increase in natural gas rates. A similar 10 percent increase became effective April 1. The board adopted the rate increase recommendations contained in a report prepared by an engineering firm. The increases, noted general manager R. J. Smith, were required for debt service to allow the district to continue to operate. Last January, the board voted a 21 percent increase to provide interest payments on a $19,500,000 bond issue; then, in February, the raise was rescinded and the 10 percent increase of April 1 was voted. With two 10 percent increases in succession, the District's rates are now at the 21 percent figure originally sought in January.

Legislation to make it easier for local gas utility districts to be established in Louisiana has been introduced in the Louisiana Legislature. Presently, if a small community desires to set up a gas district, a parish-wide vote is required. Cost of elections has discouraged some proposals, so the new bill would make necessary only the approval of citizens in the affected district.

Something new has been added in gas appliances — it's a "foldaway" counter-top cooking unit with two gas burners that can be built in anywhere. The unit, introduced by Dixie Products, Inc., of Cleveland, Tennessee, folds into its own slim, square-cornered cabinet when not in use. Folded away, it occupies less than one square foot of counterspace. Unit also includes such features as a "Burner with a Brain," automatic gas shut-off when unit is folded away, continuously burning needle-point pilots, surface light, and other features.

The flexible joint... especially designed for river crossings and other difficult installations

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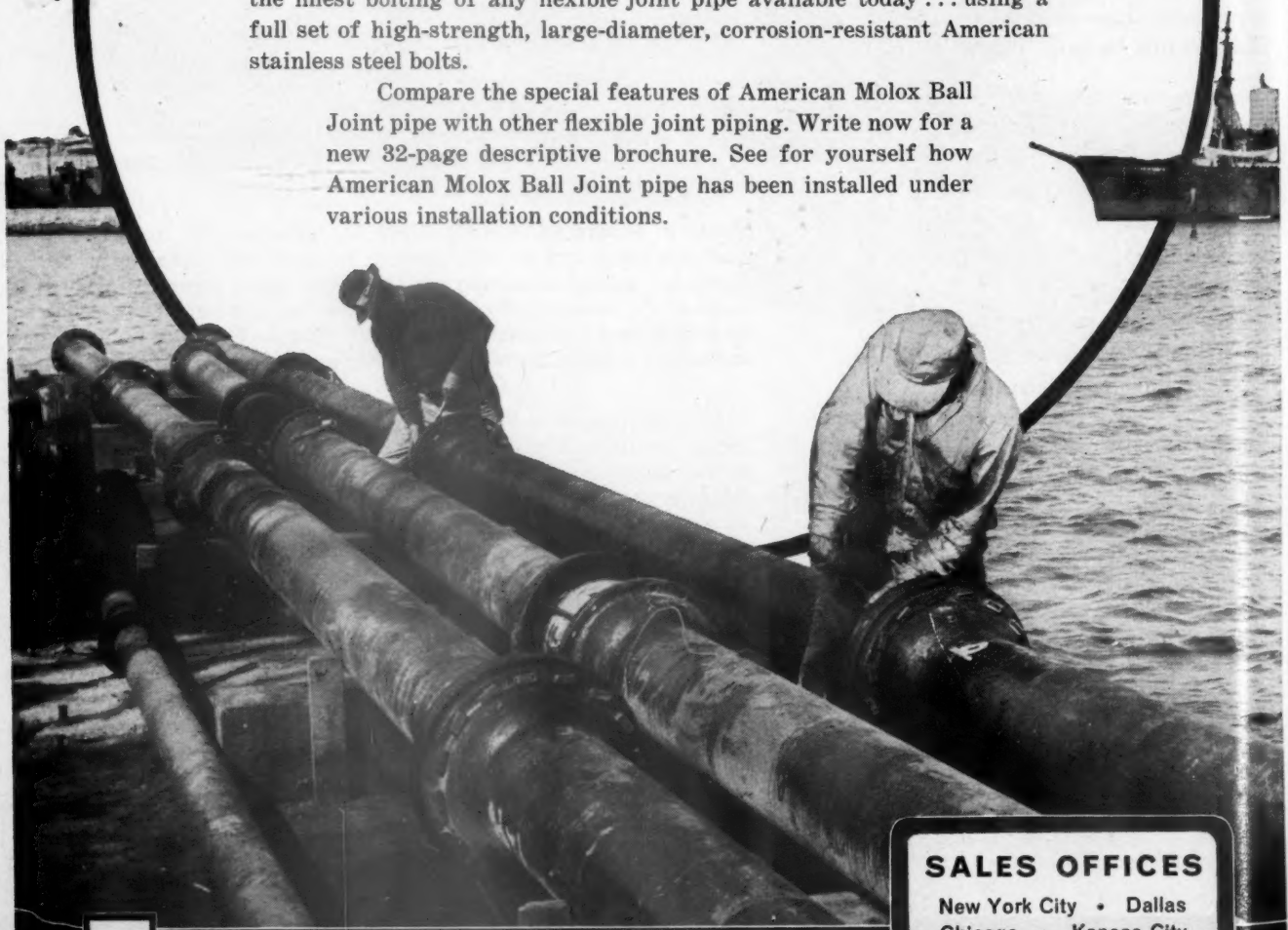
Compare the special features of American Molox Ball Joint pipe with other flexible joint piping. Write now for a new 32-page descriptive brochure. See for yourself how American Molox Ball Joint pipe has been installed under various installation conditions.



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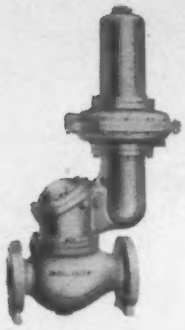

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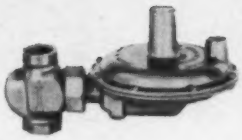

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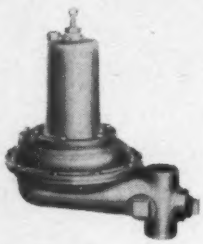

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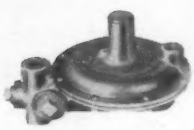

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About this article:

The need for a rapid method of collecting load data for analysis of low-pressure distribution systems arose from the building expansion and conversion to gas heat that every company experienced during the postwar period (1946-1957).

Low-pressure distribution systems, which were adequate for predominately low residential heat saturations, were suddenly faced with the demand of new residential customers. The trend here for new customers was to residential heat classifications, with an unprecedented growth in the number of conversions from residential to residential heat classifications.

The growth was so rapid that The Manufacturers Light and Heat Company, like many companies, could not keep pace with the demand. Heating restrictions were enforced to ensure an adequate supply of natural gas for existing customers. This was a breather period for the low-pressure distribution systems. Additional supplies of natural gas were obtained, however, and residential heating restrictions were lifted except in some locations that were known to be low-pressure areas because of some local condition. In time, all residential heating restrictions were lifted.

To adequately serve its customers, improvements were made to the low-pressure systems as required. In 1953, the Columbia Gas System, with which Manufacturers is affiliated, acquired a McIlroy Network Analog Flow Analyzer. This analyzer fulfills the needs for designing new construction, the replacement of inadequate facilities, and designing future construction for our low-pressure systems. To utilize the analyzer to its fullest, a definite need arose for collecting competent load data rapidly. The method developed is discussed in this article.

For analyzing low-pressure distribution systems, here's a . . .

Rapid Method of Collecting Load Data

D. J. Kesel and J. D. Slater
The Manufacturers Light and Heat Company
Pittsburgh, Pennsylvania

EVERY GAS DISTRIBUTION ENGINEER recognizes the need for competent data to be used in the design of both new and expanding existing systems. A rapid method for collecting load data for the analysis of low-pressure distribution systems is presented here; in this presentation, an attempt is made to utilize data that is common to all companies. To this data we will apply design factors that have been developed through some five years of research and have proved themselves to be the most competent method yet conceived in our organization.

No pretense is intended that this is the only solution to the collection of load data but, rather, that this is a method that we have found to be both rapid and competent. It offers a means that other gas companies, faced with similar problems, can readily adapt to their use.

When an engineer is faced with the problem of strengthening an existing system to accommodate additional loads, he must necessarily make use of every source of reliable data at his command. The more this data reflects actual operating conditions, the more secure he can feel that he is working with a reliable tool. Specifically, the basis of this method of load data collection is the actual customer's past usage. Measured towns have been used to substantiate this method. Also, improvements to plants made from this data (which, in turn, was fed to the McIlroy Network Analog Flow Analyzer) were proved by this past winter's experience.

Obviously, it is beyond the scope of this article to digress into such related problems as the types of regulation, pressure ranges of the system, future loading, and many other problems of equal importance. The method to be outlined herein should serve as an appropriate starting point from which to launch an extensive study of an integrated gas distribution system.

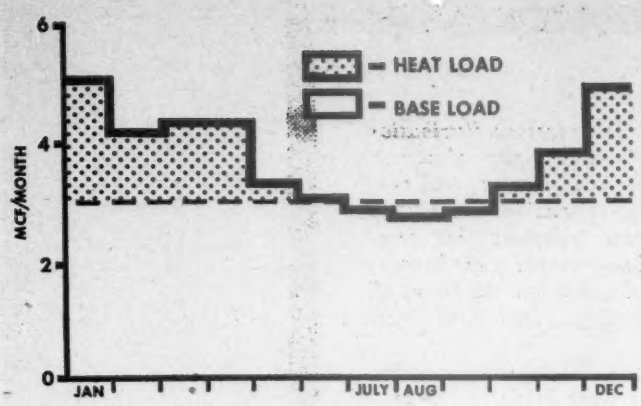


FIG. 1. Average usage chart for residential non-heat customer.

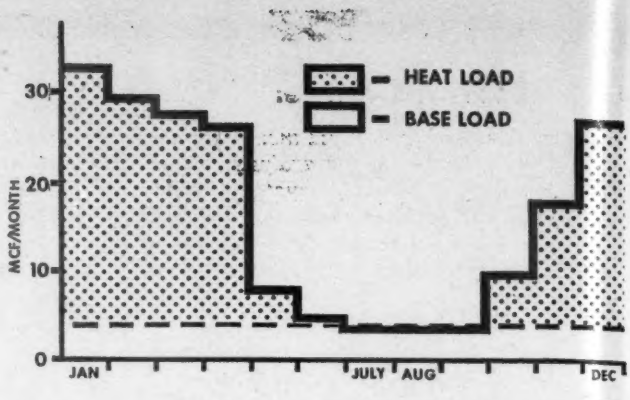


FIG. 2. Average usage chart for residential heating customer.

Steps In Collecting Load Data

There are three major steps to be followed in collecting load data by this method. They are as follows:

I. Development of Design Factors

II. Accumulation of Load Data

III. Application of Load Data

I. Development of Design Factors

The key to the method set forth in this paper is the development of design factors. The design factor is by no means an accurate method of determining one particular customer's consumption but, rather, is a method of determining a maximum hourly consumption for a small group of customers. One customer in a small group may use more gas during the maximum hour than another in the same group. However, distribution engineers are not interested primarily in this fact for typical network distribution systems but, rather, they are interested in the overall effect of a particular system's maximum hour consumption on the main feeder lines within a system.

The design factor is based on the assumption that all classifications of customers use natural gas annually for two primary purposes. The first is base load usage which is used at a somewhat constant rate each month of the year. The second is the heat load usage, and it is assumed that it varies according to the total annual degree day deficiencies. Fig. 1 illustrates the monthly usage for a residential non-heat customer, and Fig. 2 illustrates the monthly usage for a residential heat customer in one area of The Manufacturers Light and Heat Company.

Basic Information Necessary Concerning Each Customer Classification:

A. Annual Usage;

B. Average Number of Customers for the Past Year;

C. Average Monthly Usage During the Months of July and August for the Past Year;

D. Average Monthly Usage During a Period of Maximum Usage;

E. Annual Degree Day Deficiencies for the Past Year.

Design Criteria to be Estimated or Obtained:

A. A Statistical Method for Determining the Annual Base Load Usage.

The method used by The Manufacturers Light and Heat Company is to multiply the sum of the average July and August consumption by the value of 6.41. This numerical value was developed by the statistical department and is used to obtain an annual base load consumption which is free from any heat usage. The value is increased from 6 to 6.41 to allow for reduced consumption in the summer because of vacations and warm weather cooking habits. This value, as stated, is statistically developed and should be examined for its suitability before application.

B. The Ratio of the Peak Day to the Average Day for Base Load Consumption.

There are no daily customer consumption records kept by our company by which this ratio can be obtained. Therefore, an empirical figure of seven percent was established by the statistical department. This ratio reflects additional consumption because of winter water temperatures and winter cooking habits.

C. The Ratio of the Maximum Hour to the Total Peak Day.

Our company utilizes the actual ratio for measured towns and an estimated six percent for unmeasured towns. The value of six percent was established

DESIGN CRITERIA: Design Mean Temperature = —3 F
Annual Degree Day Deficiency = 5905
Ratio of Maximum Hour to Peak Day = Estimated 6%

Average July usage/customer		3.25 Mcf
Average August usage/customer		3.09 Mcf
Total		6.34 Mcf
Times		6.41
Calculated annual base load/customer		40.64 Mcf
Total annual usage/customer		164.27 Mcf
Less calculated annual base load/customer		40.64 Mcf
Calculated annual heat load/customer		123.63 Mcf
Base load peak day/customer	$\frac{40.64 \times 1.07}{365}$ =	.119 Mcf/Day
Heat load peak day/customer	$\frac{123.63 \times 68}{5905}$ =	1.423 Mcf/Day
Total peak day/customer		1.542 Mcf/Day
Maximum hour/customer	$1.542 \times .06$ =	.0925 Mcf/Hour
Average maximum month usage/customer		31.25 Mcf/Month
Design factor	$\frac{.0925}{31.25}$ =	.00296

FIG. 3. Typical design factor determination for a residential heating customer.

from experience gained in analyzing measured towns.

D. The Design Mean Temperature for the Area.

For the purposes of illustration in this paper, we will assume a design mean temperature of –3 F. The degree day deficiency for this temperature is 68.

The following formulas were developed using the above information and theory:

$$\text{Base Load Peak Day} = \frac{(1.07)\ (\text{Calculated Annual Base Load Usage})}{365}$$

$$\text{Heat Load Peak Day} = \frac{\left(\begin{array}{c}\text{Degree Day Deficiency}\\ \text{for Design Mean Temp.}\end{array}\right)\ \left(\begin{array}{c}\text{Calculated Annual}\\ \text{Heat Load Usage}\end{array}\right)}{\text{Annual Degree Day Deficiency}}$$

$$\text{Total Peak Day} = \text{The sum of the base load and heat load peak days.}$$

The total peak day for each customer classification is converted to a maximum hour by using the ratio of the maximum hour to the peak day for the area or by using an estimated ratio of six percent. The maximum hour is then divided by the average maximum monthly consumption to determine the design factor for a particular class of customer. Fig. 3 illustrates a typical design factor determination for a residential heat customer in a particular area of The Manufacturers Light and Heat Company.

The developed design factors are then used to determine the maximum hourly consumption of an individual customer by multiplying the customer's maximum month consumption by the calculated design factor.

In the development of the design factors, diversity and wind factors have not been discussed. The factors are hidden but they are inherent as part of the ratio of the maximum hour to the maximum day. Other portions of the development are statistically determined. As can be seen by the development, The Manufacturers Light and Heat Company has a monthly meter reading period while other companies may have bimonthly meter reading periods. The development could be varied easily to take this into consideration. Any winter month or period could be used to develop load data providing it represents the peak demand. The development of the design factor is, in itself, an engineered solution to the problem of collecting load data for a distribution system.

II. Compilation of Load Data

The design factors for each customer classification are forwarded to the centralized billing department requesting load data for the particular area to be analyzed. The load data consists of the following material:

A. IBM Mark Sense Meter Reading Cards or Addressograph Sheets.

B. IBM Summary.

The new type IBM Mark Sense Cards are now being used for meter reading in the Columbia Gas System. These cards with the maximum month consumption are made available as part of the load data. They contain the customer's name, address, account number, and classification. A series of IBM Mark Sense Cards is illustrated in Fig. 4. Addressograph sheets were formerly used in place of the IBM Mark Sense Cards.

The IBM summary is a result of calculations computed by the IBM Model 650 Computer. The design factors for each classification are multiplied by the maximum month consumption of the proper customer classification to obtain a maximum hour consumption. The following information is contained in the IBM summary as illustrated in Fig. 5:

Company Number
District Number
Unit Number
Local Office Number
Town Number
Book Number
Account Number
Customer Classification
Monthly Consumption Expressed in Mcf
Design Maximum Hour Usage Expressed in Mcf Per Hour
Design Maximum Hour Usage Segregated by Customer Classification

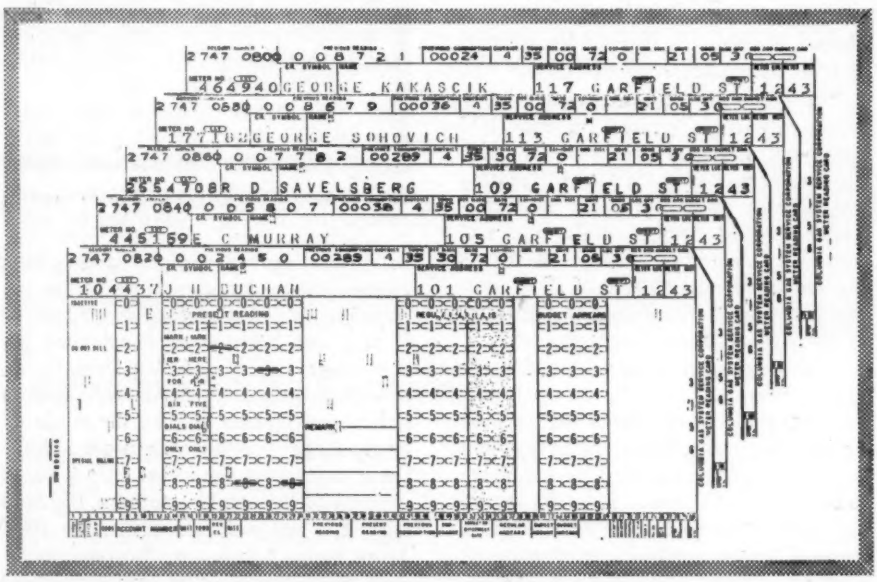

GEORGE KAKASCIK 117 GARFIELD ST 1243
GEORGE SOHOVICH 113 GARFIELD ST 1243
R D SAVELSBERG 109 GARFIELD ST 1243
E C MURRAY 105 GARFIELD ST 1243
J H BUCHAN 101 GARFIELD ST 1243

FIG. 4. Series of IBM Mark Sense meter reading cards.

CO.	DIST.	UNIT	L. O.	TOWN	BOOK	ACCOUNT NUMBER		CLASS	CONS.	M.C.F. HR.	RES.	RES. HT.
7	4	21	30	35	05	2747	720	30	34.0	.102		.102
7	4	21	30	35	05	2747	760	00	4.0	.012	.012	
				35	05	2747	780	00	1.0	.003	.003	
				35	05	2747	800	30	42.8	.128		.128
				35	05	2747	810	00	7.0	.020	.020	
This Portion of the IBM Summary Pertains to the Series of IBM Mark Sense Meter Reading Cards in Figure 4				35	05	2747	820	30	38.8	.116		.116
				35	05	2747	840	00	3.9	.011	.011	
				35	05	2747	860	30	39.0	.117		.117
				35	05	2747	880	00	4.2	.012	.012	
				35	05	2747	900	00	4.1	.012	.012	
				35	05	2747	940	00	7.0	.020	.020	
				35	05	2747	960	00	4.9	.014	.014	
				35	05	2747	980	00	2.4	.007	.007	
				35	05	2747	1000	00	4.2	.012	.012	
				35	05	2747	1020	30	33.2	.100		.100
				35	05	2747	1240	00	4.0	.012	.012	
				35	05	2747	1260	30	45.8	.137		.137
				35	05	2747	1280	30	46.3	.139		.139
				35	05	2747	1320	30	39.0	.117		.117
				35	05	2747	1340	00	3.0	.009	.009	
				35	05	2747	1360	00	2.7	.008	.008	
				35	05	2747	1380	00	6.1	.018	.018	
				35	05	2747	1400	00	3.6	.010	.010	
				35	05	2747	1420	30	24.7	.074		.074
				35	05	2747	1440	30	34.5	.104		.104
				35	05	2747	1460	30	39.5	.119		.119
				35	05	2747	1470	30	37.3	.113		.113
				35	05	2747	1480	00	6.4	.019	.019	
				35	05	2747	1500	00	5.2	.015	.015	

FIG. 5. Section of an IBM Summary.

III. Application of the Load Data

The IBM Mark Sense Cards and the IBM summary are correlated to obtain the average hourly loads on a distribution system. As stated before, the distribution design engineer is more interested in the overall effect of a particular system's maximum hourly consumption on the main feeder lines within a distribution system than the maximum hourly consumption of an individual residential customer.

The IBM Mark Sense Cards are first utilized to find the account numbers of customers located on a particular pipe section in the distribution system. Meter reading routes for distribution systems in The Manufacturers Light and Heat Company are arranged in patterns as shown on Fig. 6. This pattern assists in the correlation of load data by locating groups of customers along various streets in the distribution system to be analyzed. In areas where streets are not arranged in symetrical pattern, local personnel are called upon for assistance in locating the customers. One or more groups of customer's account numbers are formed by the pattern of the meter reading route.

The customer account numbers obtained are then located on the IBM summary. The load in Mcf per hour for the pipe section is calculated by totaling the average hourly load for each customer account number on the pipe section. The customer account numbers marked off on the section of IBM summary in Fig. 5 correspond to the series of IBM Mark Sense Cards in Fig. 4.

The maximum hourly load for the pipe section can then be proportioned according to the customer distribution or by using a distribution of 50 percent to each junction point. The loads are then totaled for each junction point. Fig. 7 illustrates a typical load diagram using a 50 percent load distribution.

The load data is now in its final form for analysis of the present system. A future loading for the system can also be developed by delineating areas of different heat saturation. The areas are given proper increase in saturation based upon experience and knowledge of the distribution system. New and proposed commercial, municipal, and residential developments are also taken into consideration.

An investigation was made in an area of 60,000 meters to determine the feasibility of developing design factors for commercial and municipal customers. Design factors ranging from 0.00290 to 0.01090 were obtained, which immediately illustrates that this is not a practical approach. This wide variation is a result of several conditions, such as oversizing of heating equipment for rapid recovery, method of operating equipment and sizing equipment to accommodate future expansion, etc. Customers in excess of 1 Mcf per hour were considered for this sutdy. It is our feeling, that, to obtain the most competent load data, a field investigation should be made of each large volume customer. Since these customers represent only a small percent of the total customers, the field survey is not a major task. The IBM Mark Sense Cards are also used to locate these commercial and municipal customers. When the maximum hourly load is considered large, a new junction point is made on the load diagram at the point of consumption.

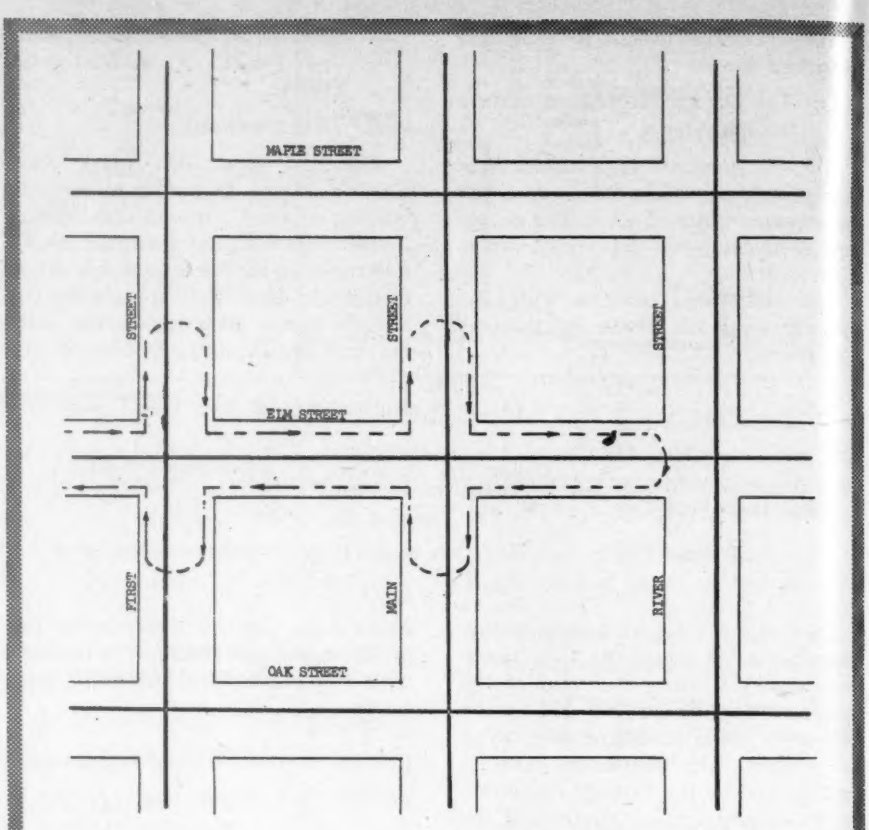


FIG. 6. Typical meter reading route used by The Manufacturers Light and Heat Company.

Summary

The rapid method of collecting load data for analysis of low-pressure distribution systems described in this article has accomplished three main purposes. They are as follows:

A. *It has reduced the time spent in analyzing distribution systems.*

A town of approximately 3000 accounts previously required about 15 man days to prepare the load data. The same town now requires only 4 or 5 man days using the method presented.

B. *It has relieved the distribution engineer of the tedious task of compiling the load data by manual methods.*

The distribution engineer, at one time, was required to compile the load data annually from the meter books. This step has been eliminated completely.

C. *The material is prepared in such a manner that clerical personnel compile the load data in its final form.*

We feel a distribution engineer can use his time to better advantage on other phases of the analysis. Technical clerks or other clerical help can, with the minimum amount of instruction and supervision, assimilate the load data into a form ready for analysis.

The use of design factors and IBM equipment have been the contributing factors in the rapid collection of load data. Even while this article was being written, a last minute development that will again decrease the actual time spent in preparing the load data was presented to our design engineers for their consideration.

The IBM Mark Sense Cards for the maximum month will be received before the IBM summary is prepared. The cards will then be grouped according to the customer account numbers on each pipe section. Each pipe section will be given a certain designation and a grouper IBM card with the same designation will be inserted with the appropriate IBM Mark Sense Cards. The grouped cards with the design factor will then be returned to centralized billing department for preparation of a new type summary sheet. The new type summary will have the designation of the pipe section included in its title and will have the maximum hourly load totaled for each group of customers.

There also has been a brief discussion concerning the collection of load data that would effectively increase the heat saturation of a distribution system for the determination of future loading. Each IBM Mark Sense Card would contain a present and future loading which would be totaled by pipe sections. This improvement will eliminate all the manual addition now being done.

It may be that this method of developing design factors is not suited to your accounting procedure, and that the method you are now using is effective. However, the advantages of IBM or similar equipment cannot be dismissed. The redesign of your present methods to utilize IBM or other equipment may be worthy of consideration. We feel this is particularly timely since the trend of most utilities is to electronic business machines. Since these machines are costly and because of their speed, they are not in full time use. Engineering departments can use them to advantage. Time is expensive, and the use of electronic computers and accounting machines can definitely reduce the overall time necessary for collecting load data.

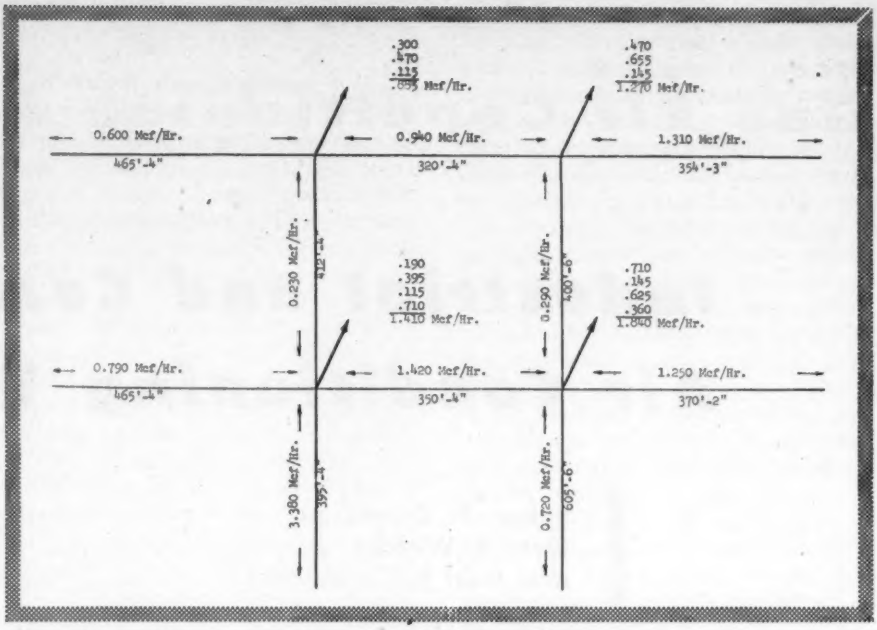


FIG. 7. Typical load diagram with 50 percent load distribution.

Acknowledgment

This article was developed from a presentation made at the AGA Operating Section Conference, New York City, May 1958. * * *

Glossary of Terms

Annual Degree Day Deficiencies — Total number of degree day deficiencies for a given heating season (October 1 to May 31).

Calculated Annual Base Load — Base load for July and August × 6.41.

Calculated Annual Heat Load — Annual usage less calculated annual base load.

Customer Classification — We consider seven main classifications: Residential, residential heat, commercial, commercial heat, municipal, municipal heat, and industrial.

Commercial Customer — Restaurants, stores, garages, schools, churches, theaters, etc.

Commercial Heat Customer — Any of the above which use gas as the principal source of heat.

Degree Day Deficiency — The number of degrees the actual mean daily temperature is below 65 F. Theoretically, no heating takes place above 65 F.

Design Factor — Factor used to multiply the maximum monthly consumption to obtain a maximum hourly rate for a particular customer classification.

Design Mean Temperature — The design temperature chosen for the mean low temperature for area to be studied converted to degrees below 65 F.

Heating Saturation — The number of residential heat customers as compared to the total number of residential and residential heat customers.

IBM Mark Sense Meter Reading Cards — Cards on which customer's consumption is marked by meter reader with special graphite pencil to be put through the IBM equipment to calculate customer's bill.

Load Data — Customer's account number, location, maximum hour consumption.

Low Pressure Distribution System — Average pressure at 5¼ to 8-oz or 9 to 14-in. wc.

Municipal Customer — City, county, borough, township, state or federal building, including fire stations, etc.

Municipal Heat Customer — Any of the above that use gas as principal source of heat.

Residential Customer — Any domestic customer who uses gas for such uses as cooking, water heating, refrigerator, incinerator.

Residential Heat Customer — Any of the above who uses gas for the principal source of heat. Note: In some cases the only use of gas is for heat. This also applies.

Type of System — Natural gas with a Btu rating of 1000 to 1040 and a specific gravity of 0.60 to 0.65.

Industrial and Commercial Air Conditioning With Gas

Robert H. Combs, *Oklahoma Natural Gas Company, Tulsa, Oklahoma;*
Clem R. Winkler, *United Gas Corporation, Houston, Texas,*
and Paul E. Chamberlin, *The Gas Service Company, Kansas City, Missouri*

WHETHER for comfort or process applications, means are available for changing the properties of air to those desired. This may involve heating or cooling, humidifying or dehumidifying, cleaning, and controlling of the distribution of air. Comfort conditioning requires that all of these be done simultaneously. Process conditioning may require any one, or a combination, of these basic functions, the nature of the process determining the goal to reach. The cooling effect in a system is produced by refrigeration. The drying effect can also be obtained by refrigeration, which condenses the moisture out of the air while cooling it. Air can also be dryed by absorbing the moisture in some material that has a high affinity for water vapor.

Basic Types of Systems

Compression refrigeration cycle. In the compression refrigeration cycle, a mechanical compressor or pump is used to convey the refrigerant vapor from the evaporator to the condenser. Vapor is drawn from the evaporator, where it has been evaporated in performing the cooling task, is compressed and delivered to the condenser, where it is liquefied, its latent heat of vaporization being absorbed by the condenser cooling medium, which is usually water or air at normal temperature. The liquefied refrigerant collects in the bottom of the condenser or in a separate container called a receiver and from there is fed back to the evaporator through suitable control valves.

Absorption refrigeration cycle. Refrigerant liquid is evaporated in the process of doing useful cooling work. The vapor produced flows from the evaporator to a chamber called the absorber, where the vapor is brought into contact with the liquid absorbent (solvent), which is unsaturated or capable of absorbing it. The unsaturated solvent is caused to flow over surfaces so as to contact and absorb a maximum of refrigerant vapor, and after having assumed a nearly saturated state, is taken out of the absorber and delivered by pump or thermosyphon action to a chamber called the generator. In this chamber, heat is applied to the mixture to drive the refrigerant out of solution. The refrigerant vapor thus formed passes from the generator to a condenser, where it is liquefied. The liquid refrigerant then flows to the evaporator, where it repeats the cycle.

The compression and absorption systems have in common the vaporizing and condensing of a liquid; they differ in that one has a compressor unit, and the other an absorber-generator unit for producing the necessary pressure difference between vaporizing and condensing levels. Both require energy for operation; power for the compression systems and heat for generation in the absorption system.

Dry desiccant system. This operates by bringing the air into direct contact with a special dry material which has a high affinity for moisture. This dries or dehydrates the air and, at the same time, heats it appreciably, necessitating removal of this heat by means of a dry-air cooler, to restore the original temperature. If comfort requirements demand some cooling effect in addition to the drying action, the air stream is cooled by evaporating water into it. In such cases a surplus of drying action is produced in the dehumidifier, so that when moisture is added to give the cooling effect, the air does not become too moist. (The most common and practical applications today use some form of refrigeration equipment in combination with the dehumidifier to give whatever amount of cooling effect is needed.) Heat is employed to dry the absorbent material, enabling it to be used over and over again.

This article is another in the AMERICAN GAS JOURNAL's series on gas air conditioning, continuing the "round-up" of discussions on the technical, economic, sales, and application aspects of this important new phase of the gas distribution industry.

This article, discussing industrial and commercial gas air conditioning, has been adapted from Information Letter No. 88, issued by Robert H. Combs, chairman, Air Conditioning and Heating Committee, Industrial and Commercial Gas Section, American Gas Association.

Air Conditioning Equipment Utilizing Gas

Gas fuel is applied to the several types of available equipment either by burning it directly, as in gas engines and direct fired absorption equipment, or through an indirect application, by use of steam or hot water, generated by gas fired boilers. In either instance the gas fuel furnishes the necessary energy to perform the particular function required of the equipment.

Compression Equipment

Reciprocating and Radial Compressors

These are driven by a gas engine. Reciprocating compressors are generally manufactured in capacities ranging from fractional tonnages to approximately 200 tons. The radial compressor is an unloading type having variable capacity control to meet the changing load conditions.

Weatherbuster gas engine units. The Weatherbuster, produced by the Weatherbuster Corporation, Camden, Arkansas, is available in the sizes from 3 to 7½ tons. This unit uses a gas engine, a belt-driven compressor, and a large fan for cooling both the condenser and engine cooling coils. Service experience has been good where the equipment is operated within its designed capacity.

The 3, 5 and 7½ ton units are available using simplified controls. The 3 and 5 ton sizes are equipped with vibration absorbing mountings eliminating the need for bolting down the unit.

Gas consumption is about 20,000 Btu per ton-hour. The air-cooled feature of these units and the fact that the units can be used for "add-on" installations combine to make attractive sales features.

Ready-power gas engine units. The Ready-Power gas engine driven compression units and package water chillers are produced by the Ready-Power Company of Detroit, Michigan. Direct expansion units are available in sizes from 20 to 76 tons. Package water chillers for companion application are available up to 150 tons. These units have been in production for more than 12 years.

Basically, they consist of:

1. A medium speed industrial type gas engine direct-connected to a variable capacity radial type compressor.
2. A completely integrated control system governing both capacity modulation and thermostat type starting. Units modulate capacity from 100 percent to approximately 7 percent.

All controls and accessories are furnished to make a complete automatic condensing unit.

Gas consumption averages 13,000 Btu per ton-hour. Service experience and maintenance costs on these units compare favorably with similar electric type units.

FLEXIBILITY. The combination of speed variation and cylinder unloading allows the capacity to be varied automatically from full load rating down to less than six tons on most models, with fuel consumption in direct proportion to the actual load throughout over 80 percent of capacity range.

Centrifugal Compressors

Today, a great percentage of large air conditioning installations, ranging from 100 tons up, use centrifugal compressors. Large tonnages are handled by this equipment powered by a turbine using steam generated by a gas fired boiler. Relatively small floor areas are required.

Gas consumption can range from about 18,000 Btu per ton-hour to 27,000 Btu per ton-hour, depending upon the type of turbine selected. The best installations are those where steam at 100 psig or higher is available. Gas turbines can also be used to drive centrifugal compressors.

FLEXIBILITY. Centrifugal compressors are particularly well suited to direct turbine drive because of their high operating speed. Capacity control is usually accomplished by varying the compressor speed and turbines can be operated at various speeds under control of an automatic valve.

Absorption Equipment

Absorption equipment, due to its inherent characteristics, lends itself ideally to the application of gas fuel. This is the type of equipment with which the gas industry is most familiar. Commercially available absorption type equipment, utilizing gas, is at present manufactured by three concerns, Carrier Corporation, York Corporation, and the Arkla Air Conditioning Corporation.

Carrier Absorption Machines

The Carrier absorption machine is manufactured in capacities from 60 to 705 tons of refrigeration. Water is the refrigerant used, and a salt solution (lithium bromide) is the absorbent. Heat can be supplied by steam or hot water generated by a gas-fired boiler. The present units are completely automatic and are of improved and simplified design. The acceptance of the unit is growing rapidly. Building operating engineers report excellent service-free operation of these units. Either high-pressure or low-pressure steam can be used at an equally low steam consumption by using a pressure reducing valve for steam above 12 psig. Steam consumption is less than 20 lb per ton-hour.

FLEXIBILITY. The efficiency of the machine is not sacrificed when operated at low load factors. Stable operation and automatic regulation of the machine are obtained down to zero percent of the rated capacity.

York Absorption Machines

York absorption machines are manufactured in capacities from 100 to 725 ton. Water is used as the refrigerant. They consist of two shells with the condenser-generator assembly in the upper shell and absorber-evaporator in the lower. The solution, evaporator, and purge pumps are located under the shells and are factory wired to a control panel attached to the unit. The absorption machine can use direct or waste steam. Any pressure higher than 2 psig is suitable. A pressure reducing station ahead of the control valve will be necessary when the steam supply pressure is greater than 15 psig. The steam consumption is approximately 19 lb per ton-hour. Starting and stopping can be accomplished manually or automatically by a time clock or similar device.

FLEXIBILITY. Capacity is controlled by a motor-operated steam control valve in the steam supply line actuated by a controller sensitive to chilled water temperature. With a decrease in refrigeration load lowering the chilled water temperature, the controller throttles the steam valve to supply just enough steam to produce the needed capacity. Stable operation and automatic regulation of the machine are obtained down to zero percent of the rated capacity.

Arkla Absorption-Type Equipment

Water chiller. This unit is designed solely for water chilling service in which the chilled water produced is pumped to a water cooling coil which may be located in an air conditioner of a central type system or it may be pumped to a unit of the unit room cooler type, depending upon the particular application. Rating of the unit is 25 tons when delivering 40 F chilled water and supplied with condensing water entering at 75 F. Steam consumption under these conditions is 18.5 lb per ton-hour; any pressure higher than 2.5 psig is suitable. The chilled water flow at these rated conditions is 2.4 gal per min per ton.

FLEXIBILITY. This unit is designed for continuous operation, with integral steam controls which will modulate to meet varying load conditions. Capacity can be reduced to as low as 50 percent of rating, with corresponding reductions in steam consumption.

"All-year" units. These units are available in 3 and 5 ton sizes. Service histories on the direct-fired 3 and 5 ton units have been excellent. The new design results in a large reduction in service potential due to the elimination of parts and controls.

The "all-year" units are ideal for small commercial installations in small stores, office suites, and similar establishments requiring both heating and

cooling from a unit occupying only a small space. (This unit requires only about 10 sq ft floor space.) Unit is completely safe, is easy to install, and is economical in operation. Full range temperature control is provided, and unit can be used for independent air circulation if desired.

Dehydration Equipment

"Kathabar" Humidity Conditioning Units

Possibly the most widely used dehumidifying equipment in connection with air conditioning comfort installations, is the Kathabar unit, manufactured by the Surface Combustion Corporation. Steam, economically generated by gas, is often used in connection with the Kathabar unit for reactivating the solution which removes the moisture from the air to be dehumidified. The absorbent used in this unit is lithium chloride (a salt solution) known as "Kathene."

Kathabar equipment has the following fields of application:

1. For the elimination of reheat.
2. For the prevention of frost on cooling coils at sub-freezing temperatures.
3. For the provision of air hygiene for hospitals, processing plants, office buildings, hotels, etc.

The Kathabar package unit contains all necessary elements, pump, regenerator, contactor, sump, and refrigerator fan in one compact assembly. The units are available in five sizes, i.e., 1100, 2500, 5000, 12,500, and 17,500 cu ft per min.

Application of Gas Air Conditioning Equipment

Air conditioning may be divided into three general capacity ranges:

1. Residential and small commercial installations, ranging in size from 3 to 25 tons;
2. Larger commercial and industrial installations, ranging from 20 to 100 tons;
3. Very large commercial and industrial installations, ranging from 100 tons up.

Comparative Costs of Operation

On the accompanying *Gas vs Electric Break-Even Chart* (Fig. 1) is shown a method for finding the gas and electric rates which give equal fuel costs.

A variety of gas and electric input rates are shown to cover the many types and sizes of air conditioning equipment available.

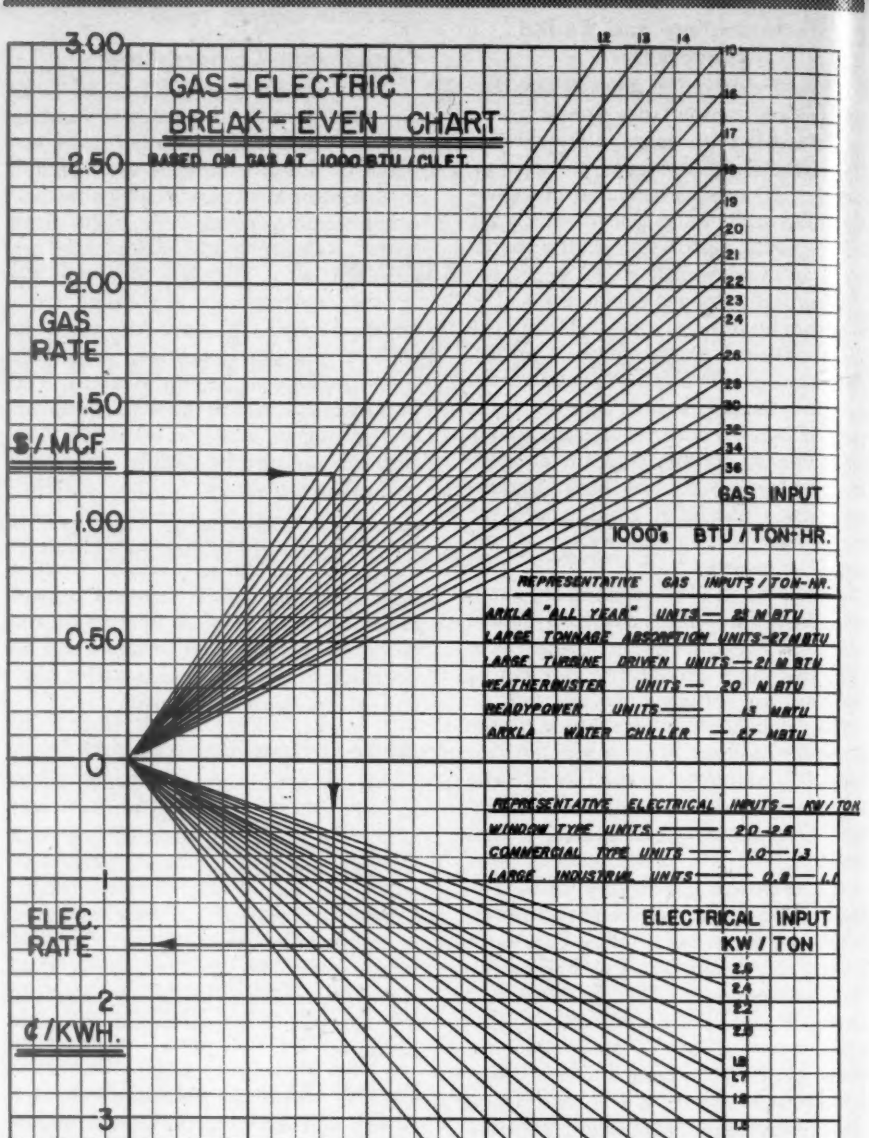


FIGURE 1

The sample problem below illustrates the use of the chart.

SAMPLE PROBLEM:

Your company is interested in having a 75 ton installation in a new building go gas. The specifications do not give any type of equipment an unfair advantage. The gas rate is $1.20 per Mcf; the competing electric rate is 2 cents per kwh. Which fuel will provide the lower fuel cost?

ANALYSIS:

Assume that the final choice rests between a Ready-Power unit and an electric motor driven unit. The gas consumption is shown (in the representative list of gas inputs) as 13 MBtu per ton-hour. The electrical input is shown (in the list of electric inputs) as being in the range from 0.8 - 1.1 kw per ton, we can choose 1.0 kw per ton.

SOLUTION: (See example drawn on Fig. 1)

1. Enter the chart at $1.20 gas rate and move horizontally to the right to the proper gas input line, 13,000 Btu per ton-hour.
2. From this point, move vertically downward to the proper electrical input line, 1.0 kw per ton.
3. From this point proceed horizontally to the left to the electric rate.
4. Read the "Break-Even" electric rate: 1.55 cents per kwh.

At the "Break-Even" point, the fuel costs are the same. Since the actual electric rate is higher than this "Break-

Even" rate, the electrical operating costs are going to be higher than the gas operating costs.

Advantages of Equipment

Ready-Power Gas Engine Driven

1. Low operating cost because of natural gas fuel and "load-match" controls which automatically vary the engine speed and pumping rate of the compressor cylinders to keep pace with the actual cooling requirements. This control system maintains a constant cooling coil temperature which means a *constant temperature and humidity control* of the surrounding air.
2. Capactiy can be varied automatically down to 6 tons on most models.
3. Fuel consumption directly proportional to load for more than 80 percent of range.
4. Low maintenance.
5. Complete "packaging" of auxiliary controls and accessory items permits quick, easy installation in a small space. All controls, instruments and accessories are mounted, wired, piped and thoroughly tested before leaving the factory. Field installation piping and wiring are kept to a minimum, thereby reducing costs.
6. Ready-Power matching chiller-condenser units are specifically designed to take full advantage of the variable capacity feature of Ready-Power engine-driven compressor units. Units and chiller-condenser units are run-in together during performance testing at the factory and are offered only as matched pairs.

Arkla Water Chiller

1. Economical operation
   . . steam source can be waste plant steam, district steam, or from heating boiler.
2. Any pressure higher than 2.5 psig is suitable.
3. Ease of installation
   . . multiple or single installations made with ease.
   . . freedom from vibration and minimum floor loading permit rooftop installation.
4. No moving parts
   . . factory sealed unit.
   . . solution flow accomplished by gravity and pressure differentials.
5. Complete safety
   . . no high pressures.
   . . unit operates under vacuum.
   . . water is refrigerant.
   . . lithium bromide is absorbent.
6. All controls for unit are made by Arkla and are on the unit when shipped — no parts to obtain locally.
7. Ideal for single or multiple unit installations because there are no moving parts to cause vibration. Unit can be placed on the roof.
8. Continuous operation
   . . capacity can be reduced to as low as 50 percent, with corresponding reductions in steam consumption.
9. One-year warranty
   . . factory-sealed refrigeration unit carries one-year factory warranty.
   . . one-year factory warranty on controls and auxiliary equipment.

Carrier Absorption Machine

1. Freedom from vibration
   . . solution pump and chilled water pump present no noise or vibration problems.
2. Compact and light in weight
   . . can be located in basement, on roof or intervening floors.
3. Economical operation
   . . heat operated using steam or hot water as heating medium.
   . . can use either high or low (2 psig) pressure steam at equally low consumption.
   . . can use hot water from 225 F to 380 F.
   . . fully automatic from full load to zero load without sacrifice of efficiency.
4. Low maintenance cost
   . . minimum of moving parts.
   . . no large motors, seals or bearings—to be damaged from improper operation or over-loading.
5. Complete safety
   . . no high pressures.
   . . operates under vacuum.
   . . water is refrigerant.
   . . absorbent is simple salt and water solution.
6. Operated by dependable controls that will start or stop machine at any hours selected.

York Absorption Machine

1. Low noise level
   . . solution is distributed over tube bundle instead of having steam tubes immersed in a mass of boiling liquid. There is no tea-kettle effect.
2. Low pump horsepowers
   . . the absence of spray heads and lower gallons per minute has materially reduced the required horsepower.
3. Crystallization minimized
   . . lower concentration of lithium bromide has all but eliminated the chance of crystallization.
4. Output closely follows load
   . . since no mass of liquid need be raised or lowered in concentration, the machine quickly responds to load changes.
5. No condenser water by-pass needed
   . . capacity is controlled by varying input steam quantity greatly reducing flywheel effect of condenser water control.
6. Easy start-up
   . . with no mass of liquid to be heated, start-up is easily accomplished by push-button or time clock control.
7. Freedom from vibration
   . . solution, absorbent, purge and chilled water pumps present no noise or vibration problems.
8. Economical operation
   . . heat operated using steam as heating medium.

Turbine-Driven Centrifugal

. . direct driven.
. . eliminates transmission losses as opposed to electric drive.
. . high compressor speeds suitable for economical operation of turbines with relatively quiet vibrationless performance.
. . handles large tonnages while occupying small floor space.
. . may be used as part of heat balance.
. . ease of turbine speed control means ease of compressor capacity control.

Weatherbuster Gas Engine Units

1. Low operating cost.
2. No cooling tower.
3. Easily maintained and serviced.
4. Low sound level — soundproof cabinet and buried muffler.
5. Suitable for application as add-on unit with any well designed new or existing heating system.
6. The engine operates at a constant slow speed (compared to an automobile engine) and uses natural gas, a much cleaner burning fuel. This design results in a minimum amount of maintenance requirements.

Suggested Service Policy

All gas utilities that expect to be successful in the sale of gas air conditioning, whether they merchandise or not, should make available both direct service and backup service on such equipment to all customer classifications. The extent and nature of this service will be established by each individual gas utility. By backup service it is meant that the minimum each utility should provide is assistance in analyzing operating problems.

The equipment manufacturers will assist with training of gas company, dealer, contractor, and user personnel in the operation and maintenance of their equipment. Readily available service is our greatest sales advantage. ★

Guide to Pipe Wrapping Techniques

M. A. Hendrickson,
Sales Manager
Pipe Protection Products
Minnesota Mining and Manufacturing Company
Saint Paul, Minnesota

STANDARD TECHNIQUES are developing for protecting underground pipes with insulating tapes; they are wrapping techniques that simplify the application of tape and provide maximum corrosion protection.

These wrapping procedures are the result of experiences of pioneering companies in the pipe protection field. These companies met wrapping problems as they came up and evolved easily followed, step-by-step methods which have been proved to work.

Outlined below are accepted methods of protecting typical pipe installations. The material used is a vinyl tape developed for pipe protection.

Wrapping welded joints depends upon the preparation of the pipe surface for success (Fig. 1). The joint area to be taped should be clean and free from sharp metal burrs. First remove kraft paper wound over the tar coating. (If the paper sticks, remove with a wood rasp or by heating it slightly with a torch. Electric paint scrapers can also be used.) Next, remove or smooth sharp weld burrs with a file, axe, or ballpeen hammer and remove excessive rust or mill scale with a wire brush.

Dust or moisture on the pipe should be removed with a rag and alcohol or other suitable solvent. A pipe primer will neutralize dust, condensed moisture films, and superficial rust accumulated during yard storage, making their removal unnecessary (Fig. 2). Primer is applied with a paint brush or is spray coated. An average paint coating is sufficient for all but extremely rusted pipe, which needs a heavier application. The primer dries in a few minutes under average conditions and the tape can be applied any time after the primer loses its shine — from one to five minutes, depending upon humidity.

Before taping a joint, (Fig. 3) apply one wrap of tape over the weld bead for extra protection (two-inch tape is enough for this purpose). Begin the main application with one complete wrap of tape starting three inches on the shoulder of the mill coating (Fig. 4). Tape should be applied half-lapped (two complete layers of tape at all points), or minimum

1 In preparing joint surfaces the area to be taped should be clean and free from burrs. The kraft paper is removed; weld burrs smoothed with file, axe, or ballpeen hammer; excessive rust or mill scale removed with wire brush, and dust or moisture on pipe removed with a rag and alcohol.

2 A pipe primer will neutralize dust, condensed moisture films and superficial rust. It is applied with a brush or sprayed on, and tape is applied in from one to five minutes.

lapped (½-in. to 1-in. over-lap, depending upon the engineer's specifications).

Some engineers prefer the wide cigaret wrap system for protecting welded joints. This system is particularly suited to large diameter pipe and big construction projects. The preparation of the joint, including the narrow tape over the weld bead is the same as for the lapped method. Then two or three feet of tape are pulled from the roll (Fig. 5), and the tape is positioned on the joint so that it covers at least three inches of mill coating on each side of the bare steel. The tape is rubbed on the pipe (Fig. 6) while another

3 A single wrap of two-inch tape is recommended over the weld bead before the joint is wrapped. The main tape application is begun with one complete wrap of tape three inches on the shoulder of the mill coating.

4 The wrap is finished by making one complete wrap over the opposite shoulder of the mill coating with three inches on the shoulder.

5 In using a wide cigaret wrap for welded joints, two or three feet of tape are pulled from the roll.

6 The tape is then positioned and rubbed firmly on the pipe while the roll is pushed down and under.

7 The roll is passed under the pipe and pulled up completing the wrap with an overlap of at least four inches. If an additional two feet of tape are pulled from the roll at this point, the roll will be ready for the beginning of the next joint.

8 The completed joint wrapping is pressed down at the ends. The joint may be jeeped as a continuous operation when it is used with heavier coatings. If high voltages are used due to thickness of tar or asphalt, a layer of felt over the tape will give added thickness and allow jeeping at 14,000 to 16,000 v.

worker pushes the roll down and under the pipe. The tape should be stretched just enough to make it conform smoothly to the weld bead and shoulder coating.

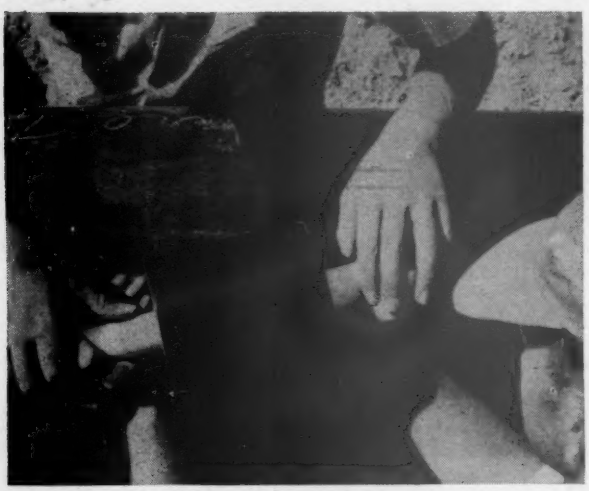
The roll is then passed under the pipe and pulled up to complete the wrap (Fig. 7). An overlap of at least four inches should be allowed in completing the wrap (Fig. 8) before the tape is cut. If an additional two feet are pulled from the roll at this point, the roll is ready for beginning the next joint.

Bends, elbows, and short sections of pipe (Fig. 9) should be wound after the bends are made or the sections installed to prevent chipping and cracking due to bending or working the pipe.

Large diameter pipe is usually taped after bending,

9 Bends, elbows, and short sections are usually wound after the pipe bends are made to eliminate the problems of chipped and cracked coatings due to pipe bending.

10 In taping straight pipe sections, large diameter pipe is usually taped after bending, positioning, and welding, to eliminate damage to the coating particularly from placement of the pipe in rough terrain.



11 The tubes in tape boxes make handy handles for use as tape dispensers.

12 A dolly running on pipe ahead of the taping machine does away with the necessity of using a sling on a taped surface.

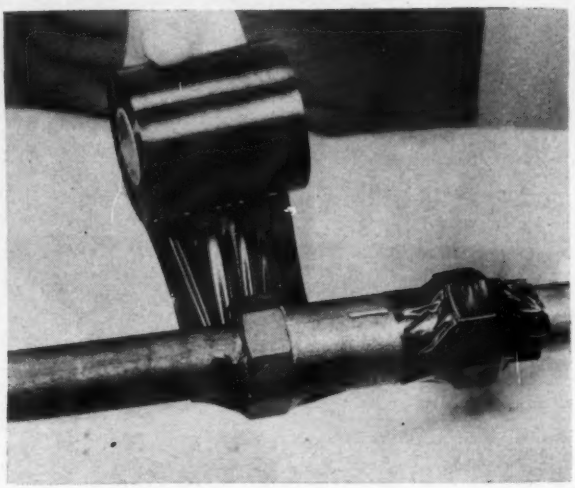
13 This pipe was assembled in a large excavated area and taped in place as the last operation before backfilling.

14 Hand power is an effective method of revolving pipe on small jobs.

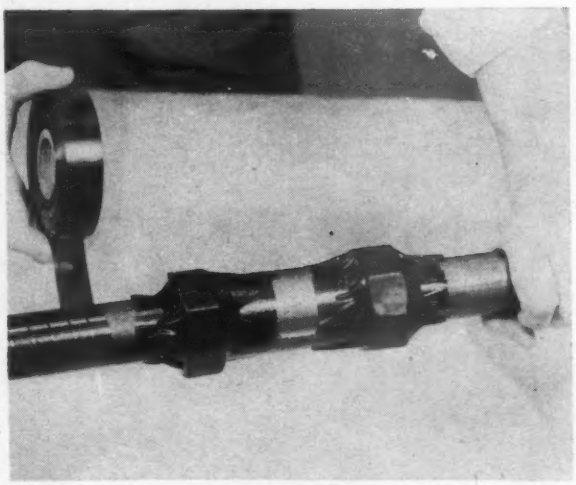
positioning and welding. This procedure eliminates damage to the coating, particularly in rough terrain. Two men are usually used to wrap large pipe (Fig. 10), passing the tape over and under the pipe by handing the roll to each other. Cardboard tubes contained in the tape package make convenient handled dispensers for this method (Fig. 11).

Pipe can be taped in place after assembly, using automatic tape-wrapping machines. When lifting pipe that has been taped, a pad of rock shield or other suitable material should be used as protection under the sling. A wire or chain sling is better than cloth, as a

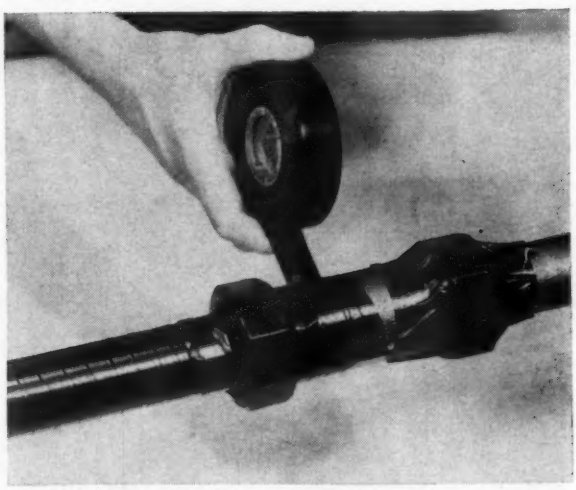
15 A pipe vise and an automatic taping machine can be combined for fast wrapping of small pipe on large jobs.



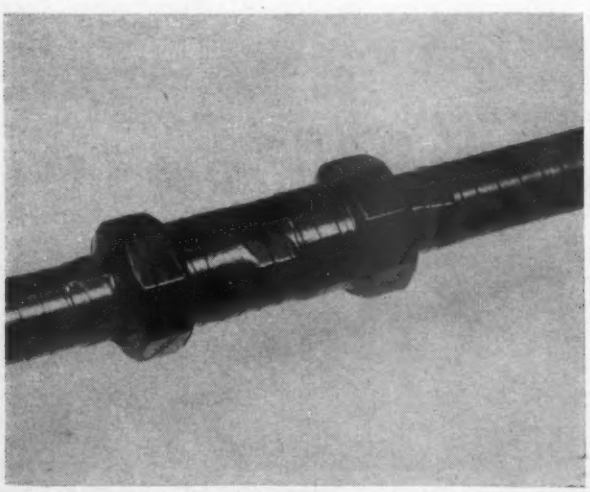
16 To use four-inch and one-inch tape on a typical fitting, stretch four-inch tape around the nuts of a compression fitting.



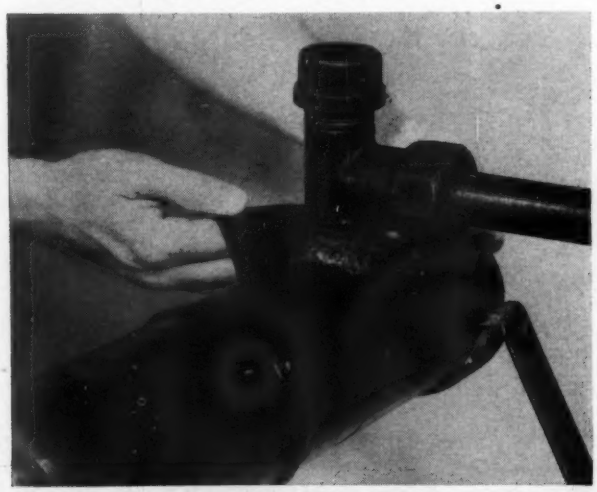
17 Wrap one-inch tape, beginning on coated pipe.



18 Wrap one-inch up to nut, pulling four-inch tape tight. From this point, wrap one-inch tape in "X" fashion on nut edges, wrapping on the edge of the nut until the tape no longer lays straight, then crossing to the other edge.



19 Complete the one-inch wrap.



20 Using four-inch and one-inch tape on a typical street "T," wrap four-inch tape around the main, forming ends around the base of the street "T."

cloth sling tends to stretch and pull the tape. A dolly running on the pipe ahead of the tape-wrapping machine eliminates the necessity of using a sling on a taped surface (Fig. 12).

Frequently, pipe assembled in a large excavated area is taped with the taping machine (Fig. 13) in place as the last operation before backfilling.

Wrapping small pipe can be done before assembly either by hand (Fig. 14) with one man turning the pipe and the other guiding the tape, or with a machine and a pipe vise (Fig. 15) for faster wrapping on large jobs.

21 On large mains where a small hole has been opened in the coating to allow welding of the "T," the hole can be patched by laying pieces of tape at an angle to cover the opening, part of the coating and the lower base of the "T."

22 Completely encircle the insulating nut with a strip of four-inch tape.

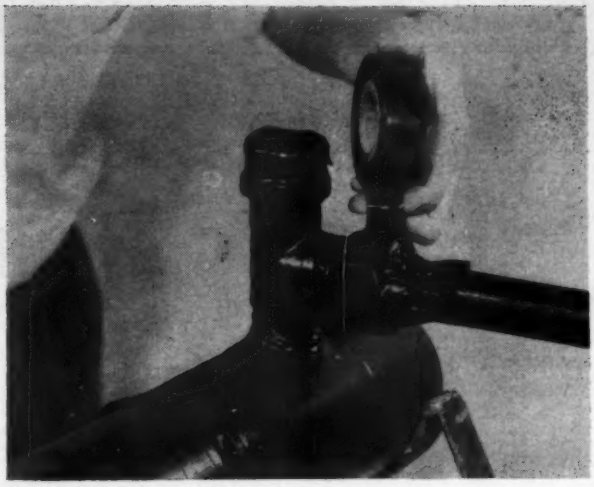
23 Encircle the cap with four-inch tape and fold in the top.

24 Place a piece of four-inch tape over the saddle of the "T."

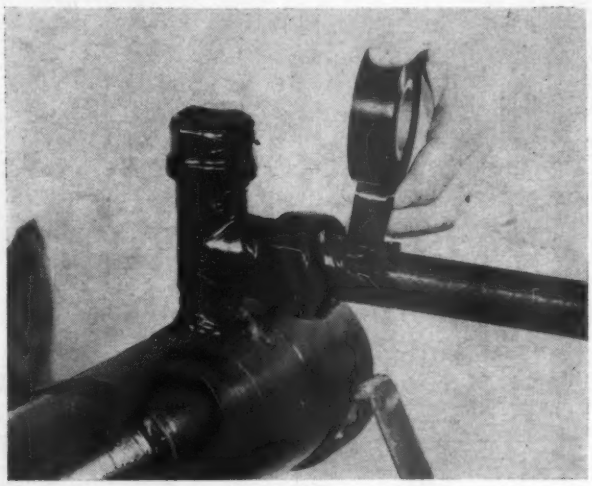
25 Start application of one-inch tape at cap base.

26 Wrap up to the cap top, over loose flaps on the four-inch tape previously applied, and then down to the saddle of the "T." Wrap downward to the "T" saddle and "X"-wrap diagonally over the saddle.

27 "X" around the saddle of the "T" enough time to tie in the four-inch underwrap.



28 Begin taping on the "T" side of the compression nut and "X" over the nut from edge to edge.



29 Cross from the "T" side of the compression nut to the service pipe base. Pull the four-inch wrap tightly around the pipe.

30 Complete the "T" wrapping.

When winding compression fittings, four-in. tape is stretched in a cigaret wrap around the fittings (Fig. 16) and then a wrap of one-in. tape is begun on the coated pipe (Fig. 17) and continued over the first fitting (Fig. 18) in an "X" fashion between the nut edges. The edge of the nut is wrapped until the tape no longer lays straight and then it is crossed over to the other edge. When the nut is covered, the wrap is continued over the sleeve, across the second nut in the same "X" fashion, and on to the coated pipe again (Fig. 19).

A typical street "T" can be wrapped using four-in. tape around the main, forming the ends around the base of the street "T" (Fig. 20). On large mains, where a small hole has been opened in the casing to allow welding of the "T," the hole can be patched by laying pieces of tape at an angle so they cover the opening, part of the coating, and the lower base of the "T" (Fig. 21). The compression nut to the "T" should be covered by encircling them with four-in. tape (Fig. 22) and the cap can be protected by encircling with the same tape (Fig. 23) folding the tape in at the top. A piece of four-in. tape is then placed over the saddle of the "T" (Fig. 24).

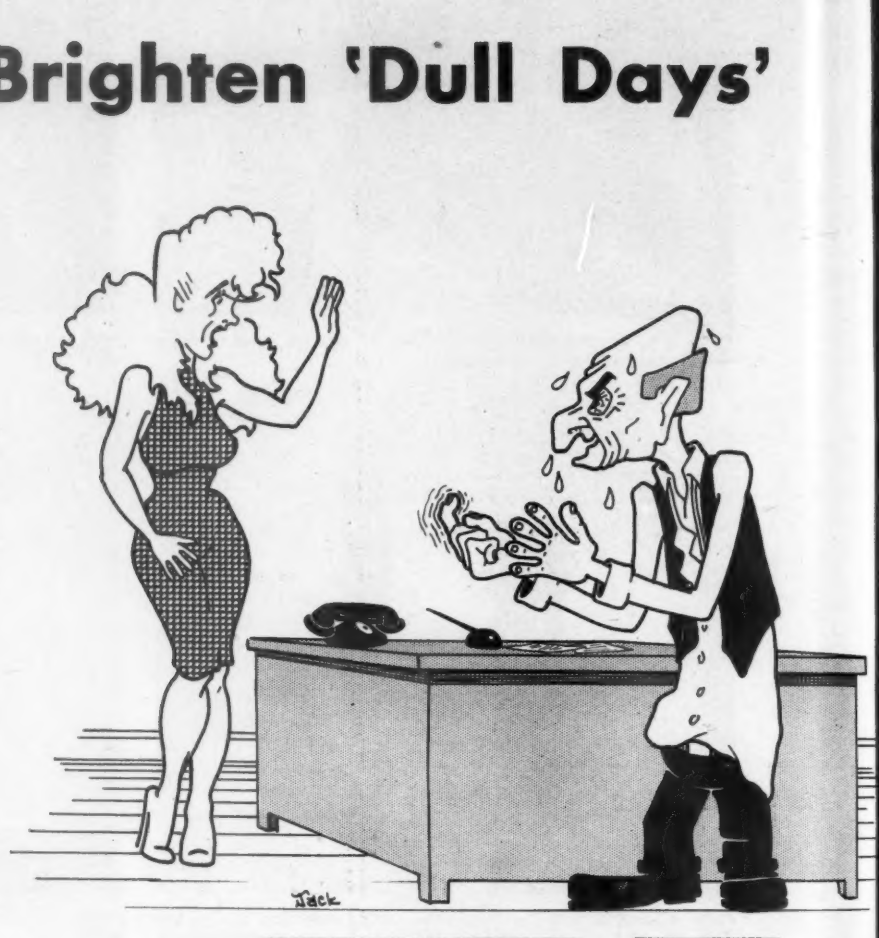
Application of the one-in. tape is started at the base of the cap, (Fig. 25), wrapped to the cap top, covering the four-in. tape previously applied (Fig. 26) and then downward to the "T" saddle and "X" wrapped around the saddle (Fig. 27) enough times to tie in the four-in. underwrap. The taping is then continued down around the "T" base and cut so that the tape end is on the flat face of the "T."

Then the "T" side of the compression nut is taped and the one-in. tape is "X" wrapped over the nut from edge to edge (Fig. 28), then to the service pipe base, pulling the four-in. wrap tightly around the pipe with the one-in. tape overwrap (Fig. 29) to complete the wrapping operation (Fig. 30).

In taping pipe, it is usually easier for one man to wrap diameters of less than eight-in. Two men can usually do a better job faster on larger pipe by passing the tape on a handle back and forth, over and under the pipe. * * *

How To Brighten 'Dull Days'

Ernest W. Fair



WAS this day another one of those when you decided around 10 o'clock in the morning that you should "better have stayed in bed?"

Such days come to all executives and unless something is done about them they are profitless and wasted days. Too many such days cut into the profits of the good days and make them mediocre.

Top-notch executives never worry about these dull days. They have become leaders because they have learned to make every day a profitable one regardless of how badly it started. All of them have developed "starters" that they put to use on those days when their spirits are low and it would be easy to forget the whole day and play golf or go to a double feature.

We've talked with a number of such successful executives about the methods they use to get by on those dull days. The "starters" they have developed can be used by every executive. They can eliminate those profitless days and make each and every one produce results.

Try Relaxing

"I've found nearly all of those days are chiefly in my own mind," one executive told us, "unless, of course, I'm physically sick. When that happens I seldom try to do anything . . . people have enough troubles without listening to a sick man trying to get through a business day.

"In my own case I've found the quickest way to snap myself out of a mental roadblock is to do something for an hour that is completely relaxing. Other executives I know follow the same plan. My method is to slip over into the park and just relax. Others read something relaxing . . . like a western or mystery story.

"The main thing is to do something completely out of your regular routine and not just go ahead and try to fight it with your regular work procedure. Doing that means a battle all day long and doggone poor results. But if you let relaxation overcome the mental depression you have, it can do a good job and in short order."

This particular individual thus sacrifices an hour of work time to make sure the remaining part of his day is resultful. His method gets results.

Several other executives with whom we talked pointed out that many such "bad starts" are due to their having become bogged down with the routine of their work. Day after day effort soon develops into a fixed pattern and that very pattern can become so boresome as to actually discourage one from any productive effort.

Develop Your Own Approach

They recognize this and solve their individual problems by developing different approaches and trying out new ideas rather than going ahead with the routine that has brought on the situation.

"I find this works perfectly," one of these men told us, "not only in shaking myself out of the doldrums but in developing a lot of good sales approaches. It gives me a chance to experiment and try out different things. And that in turn results in my becoming a better business man simply because I do work out these new approaches.

"I've also found that I have less and less such bad days now, because I'm working away from a monotonous routine that seems to bring these on."

Another executive explains that such a system gives one an experiment to try, and in putting his mental facilities to a new problem, he shakes off the doldrums that have made the start of that particular day a gloomy one.

Why 'Dull Days'?

Doctors tell us that such mornings are often the result of a long series of days and nights that have resulted in

overuse of our physical facilities and drained our "pep" and "energy," both mental and physical. A series of days of extra work at night (or play into the late hours), driving oneself overly hard for many successive days, and similar situations bring about those mornings when in truth we really "should have stayed in bed."

"Most business men who are successful men are those who do have drive and initiative," one doctor told us, *"for without it they could not be successful men. Many fail to realize that this drive calls for regular periods of thorough and complete relaxation. The man who works hard five or six days a week definitely should secure complete rest and relaxation for at least a day thereafter . . . not more hard, driving work or play.*

"It's really odd how we all realize that our machinery and mechanical equipment can suffer fatigue and how we provide for its rest . . . but completely ignore the fact that the human machine must also rest and relax."

Many executives who do realize this find that when those mornings occur, that is the day on which they should stop and relax. Such relaxation should be thorough and complete (both mental and physical) or it will accomplish little. They find, invariably, that when they do so they are "rarin' to go" again the next morning.

How's Your Diet?

Improper diets have often brought on such bad mornings. Some of us, in trying to cram every possible moment with results, skip lightly over meals or eat improperly in the process of a hurried and busy life. Our "human machine" must have the proper proteins, calories, and other minerals and chemicals in order to keep going ahead at a result getting pace. If it does not, a mental and physical lag ensues.

It's not so much a matter of insufficient food as of the lack of proper food. An examination of what we've been eating during the past two or three weeks can often point up a very good reason why we are far from ready to go at our job on any particular day when such a mood hits us.

Avoiding let downs, from the foregoing reason, calls for closer watch of what one eats and making sure our energy and spirits are kept up by proper diets during every business day.

Outside Interests Are Vital

Outside incentives also help to eliminate these "dead morning" incidents, we have been told by a number of authorities. They point out that such live outside incentives not only furnish spurs to better effort but serve as a counter balance to the routines of the job and help provide the needed spark to keep us going through even the dullest of days.

"I'm always suspicious of a man who has no outside interests," one executive told us the other day, "because my own experience has been that his results are not achieved from any particular spark or driving ability but from sheer plugging and that doesn't set the big records alone.

"I look for a man who is an avid golfer, hunter, baseball fan, immersed in some civic club work, or has some such interest. I know that he has the proper counter balance against his job. I find that such men seldom if ever have those 'bad mornings' you're talking about . . . they're always fresh and ready to go."

Each of the foregoing suggestions is working today for top executives in many lines of business and under all sorts of different conditions. They are the sparks that keep these men on their toes with never a "let-up day" due to that "better I should have stayed in bed" feeling in the morning. They help keep away the physical and mental conditions which bring on such situations; make it possible for every day to be a good business day. * * *

For extreme sensitivity

Spring Loaded Appliance Regulator. Model 5500M

Norwalk

PRESSURE BALANCED REGULATORS give close control

Norwalk's complete line of custom built commercial and industrial appliance and service regulators are extremely sensitive and give close control over wide ranges of gas flow. Spring loaded and dead weight models for inlet pressures up to 100 psi and outlet pressures as low as 3" W C in pipe sizes from ½" to 24".

Norwalk Regulators are custom designed and individually tested to meet special as well as standard needs. They provide the safety and low maintenance costs that have made Norwalk Valves famous for long life and dependability for 80 years.

For positive control of gas and air— *Call Norwalk.*

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Established 1878

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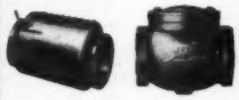

Check Valves
Pipe Sizes ⅜" to 42".
Screwed end Models to 4".

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Pressure or Vacuum.

Pressure Controllers
Pressures to 5 psi.

Appliance Regulators
Pipe Sizes ½" to 2".

Station Regulators
Pipe Sizes 3" to 24". Liquid Seal or Diaphragm Types.

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Pipe Sizes ½" to 24".

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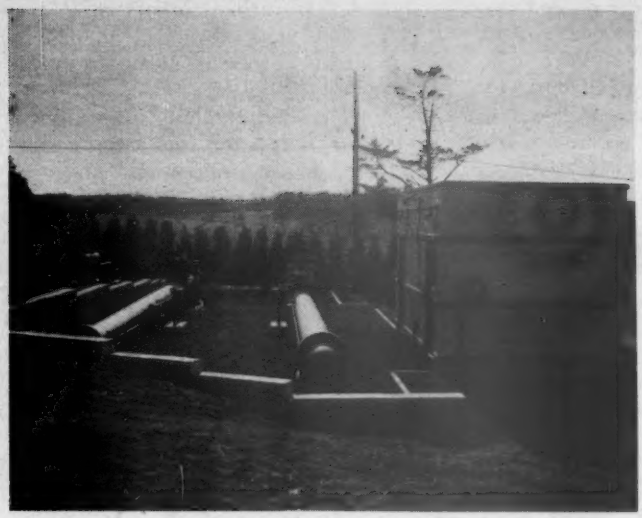
Complete Engineering Cooperation



New odorization plant placed in service at Dranesville, Virginia, by Washington Gas Light Company is shown in the two photos above. At left is exterior; at right, the interior, finished in white tile-brick. Plant's equipment operates automatically, adding odorant proportionately to gas entering system at Dranesville city gate. Included in facilities is an air purification system that eliminates all nuisance odors that might escape to atmosphere.

"WHERE GAS IS GROWING"...

Distribution Developments

. . . news about current and planned construction

Bigger mains to increase storage potential at St. Louis for Laclede Gas Company are shown being installed by street department workmen. Below, welder makes pass on a 30-in. line that connects all injection-withdrawal wells and the storage compressor station with the main distribution system. Other workmen are shown lining up next section of pipe, while trencher in background cuts ditch.

United Cities Gas Company, Chicago, Illinois, is currently working on numerous construction projects throughout its divisions in the states of Illinois, Tennessee, North Carolina, South Carolina, and Georgia, which involves the installation of 130,000 ft of 2, 3, and 4-in. additions and extensions to intermediate pressure systems (2 and 3-in.) and additions to high pressure feeder systems (3 and 4-in.). Total estimated costs of the work is $165,000. All work is being done by company forces and is to be completed by November.

Northern Ontario Natural Gas Company, Ltd., and Twin City Gas Company, Ltd., Toronto, Ontario, will bury more than $3,000,000 in northern Ontario this summer in the form of new natural gas distribution systems in 34 communities in that area. A total of 2,507,842 ft of pipe will be laid, varying in size from ¾-in. service lines to 12-in. high pressure supply mains. All pipe being laid is coated – the majority in pipe coating yards set up at railheads by F. E. Shaw, Ltd., contractor. Some coating will be done over-the-ditch. Regulators and relief valves for the

Stretch Dollars . . . Save Manpower with equipment that does more!

WORK BULL 202 with POWER-MATCHED AUBURN TRENCHER WILL DIG IN MORE ADVERSE CONDITIONS THAN ANY OTHER!

Davis 210 Backhoe on Work Bull 202 or 303 . . . only machine that can dig flush alongside walls, etc.

Pipe and Cable Layer on Work Bull 202 buries lines up to 1½" dia. to a depth of 18½" at 2 to 3 mph.

Work Bull 1001 with Backhoe-Backfill Blade handles excavating, filling without changing attachments.

Here is a top-quality rig for digging utility lines, sewers, irrigation ditches, foundations, footings, laterals, gathering lines, and hundreds of other profitable jobs . . . and it's the best in the business when the going is really tough!

TRACTOR AND TRENCHER FORM AN INTEGRATED DIGGING UNIT with geared spacer of the Auburn Trencher built into the power train of your Work Bull 202. The Tractor is lengthened 3½", providing better balance and control for straight, smooth-walled trenching. ***Exclusive Gear-Draulic Drive*** lets you operate at speeds variable from zero to 600 feet per hour . . . automatically adjusts power to compensate for changing ground conditions. Complete control from the driver's seat facilitates fast, accurate digging with a minimum number of work interruptions.

PATENTED NON-CLOGGING CUTTING BITS have no pockets . . . do not fill with loosened dirt, nor jam under wet and clay conditions. Special chisel-type Pent-A-Bits in 5", 8", 11", and 14" widths are available for digging in rock, shale, or frozen ground that other equipment can't handle.

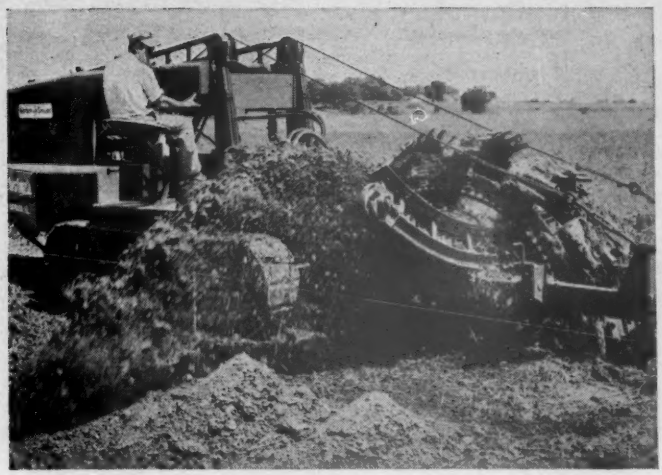
VERSATILITY FOR WIDE RANGE USE! Your Auburn Gear-Draulic Trencher travels from job to job at the road speed of your Work Bull 202 . . sets up fast in corners and other difficult locations. 190° vertical operating arc lets you dig straight down from the starting position or back-trench under sidewalks, streets, and other obstructions. You can dig 6", 8", 10", 12", and 14" widths in trenches up to 6' deep! Combined with a Davis Loader on the front of your Work Bull 202, one rig efficiently handles your complete digging/backfilling operations.

OTHER MASSEY-FERGUSON POWER-MATCHED PACKAGES include the Work Bull 1001 Multi-Purpose Tractor Loader (60.3 hp), Work Bull 303 Tractor (54.5 hp), Work Bull Fork Lift, and Davis Loaders and Backhoes . . . plus a multitude of integrated attachments for each basic unit.

For information on the complete Massey-Ferguson line ask for Brochure G-4. For specific information on the Work Bull 202 with Auburn Trencher, ask for Brochure A-2. Write Massey-Ferguson Industrial Division, 1009 South West Street, Wichita 13N, Kansas.

MASSEY-FERGUSON INDUSTRIAL DIVISION

There's a Barber-Greene ditcher to speed your jobs . . . to cut your costs



The two most advanced ditchers on the market. Left: Model 774 with wheel. Right: Model 784 with vertical boom.

Two machines in one. The same chassis can be used with wheel for cross-country digging where speed is important or with vertical boom for city work where tight quarters and frequent obstructions are encountered.

The Model 774 Wheel Ditcher digs to 66" deep, 30" wide. Model 784 Vertical Boom Ditcher cuts to 7' deep, 24" wide. Both machines offer exclusive dual-range Hydra-Crowd for infinitely variable digging speeds to 31' per minute, hydraulic controls, hinged connector between chassis and boom that eliminates twist and tilt, all-hydraulic spoil conveyor, automatic overload protection, new crawlers, and many other years-ahead advantages.

Crowding speed independent of wheel or bucket line speed. Can be changed instantly without stopping machine. Conveyor speeds infinitely variable—instant reverse.

House services. Model 705-B Runabout digs to 48" deep or more, 10½" wide. Favorite among utilities for house services. Vertical boom digs up to obstructions, leaves no ramp. Hydra-Crowd gives infinitely variable digging speeds. 15 m.p.h. travel.

Scattered jobs. Model 711 digs to 5' deep and 18" wide. 45 m.p.h. travel speed minimizes between-job time. One-man operation. Hydra-Crowd assures instant selection of correct crowding speed for every digging condition. Convenient operator's cab.

Narrow trenching. The Model 702 is a remarkably low-cost unit that digs to 5" wide, 40" deep. Ideal for cable, conduit, small pipe. Highly mobile. Varidraulic drive gives finger-tip control of crowding speeds from 0 to 20' per min. Exceptionally rugged.

58-7-D

Write for information on all ditchers in the Barber-Greene line of advanced design.

Barber-Greene BG

AURORA, ILLINOIS, U.S.A.

CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

Over a mile of 8 and 10-in. main was laid recently in New Orleans by construction crews of New Orleans Public Service, Inc., to "close the loop" in the company's high-pressure main system along the Lakefront and Industrial Canal. New loop will strengthen the area gas distribution system and facilitate supply of gas for future needs in the area. In photo above, left, construction foreman holds surveying rod to check depth of trench cut by truck-mounted backhoe prior to laying new pipe. Above, right, workmen prepare to install auger on hydraulic boring unit prior to making a 12-in. bore under railroad tracks.

new systems will cost another $155,000. Total cost for the entire construction program of the two companies is estimated at $15,000,000.

British Columbia Electric Company, Ltd., Vancouver, British Columbia, Canada, is spending more than $11,500,000 in 1958 for expansion of its natural gas system. Gas mains are being installed in the greater Vancouver and Fraser Valley areas at a rate of 118,000 ft monthly. At the end of 1957, total installed mains in metropolitan Vancouver was 1171 miles, with another 376 miles serving the Valley area. Main skeleton for the Vancouver area distribution system is now complete, and an average of 65,000 ft of smaller pipe is being installed monthly to extend service to new customers. In Fraser Valley, work on the main distribution system is continuing, with an average 53,000 ft being installed each month. In addition, two supply lines, totaling 200,000 ft are being constructed to permit increased flow to the north and south ends of the city area. They include a 12-in. high pressure supply main from Pitts Meadows to Coquitlam, and a 20-in. main from Coquitlam to the Grandview holder station, operating at a lower pressure.

Saskatchewan Power Corporation, Regina, Saskatchewan, Canada, has underway a large scale construction program involving installation of distribution systems in 13 cities and towns in its service area of Saskatchewan. Included in the program are the construction of 57,000 ft of ¾ thru 6-in. mains and services in Maple Creek, to cost an estimated $385,000; construction of 145,000 ft of ¾ through 8-in. mains and services in Weyburn, at an estimated cost of $450,000; construction of approximately 325,000 ft of ¾ through 8-in. mains and services in Estevan, at an estimated cost of $900,000, and construction of approximately 210,000 ft of ¾ through 4-in. mains and services in the communities of Prud'homme, Domremy, Dodsland, Lampman, Springwater, Mortlach, Kinley, Success, Plenty, and Parkbeg, at an estimated cost of $350,000. All work is being done by contractors, and is estimated to be completed by October 1, 1958.

PROFESSIONAL DIRECTORY

Design EGE Construction

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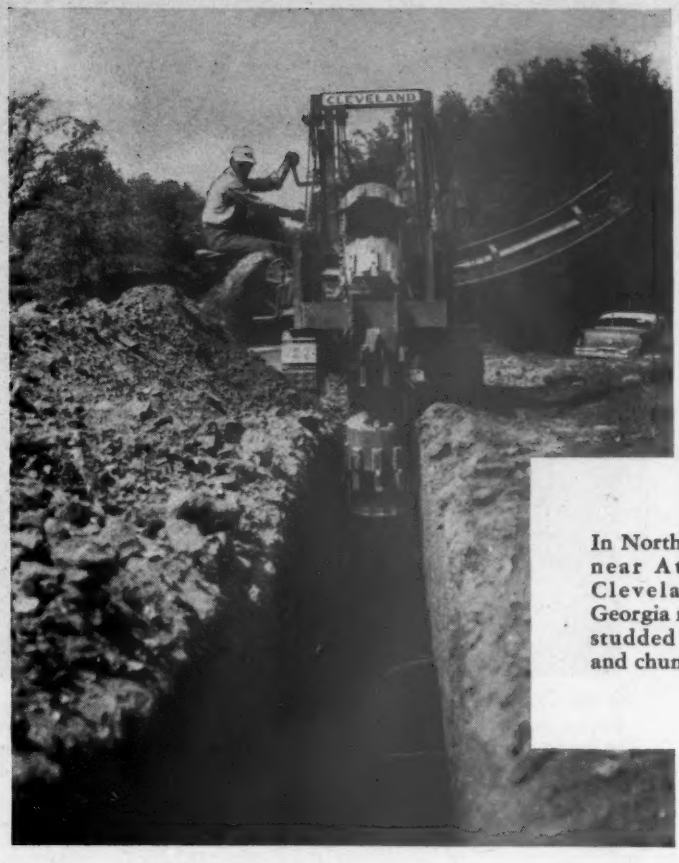
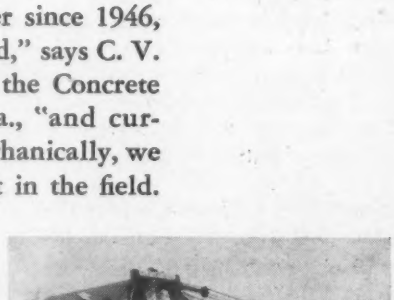


In North Druid Hills near Atlanta, this Cleveland 95 digs Georgia red clay, often studded with quartz and chunks of granite.

nine Clevelands . . . never a failure in the field

"We have used Clevelands ever since 1946, when our company was organized," says C. V. Lanier, field superintendent for the Concrete Construction Co. of Atlanta, Ga., "and currently we are operating nine. Mechanically, we have never had a Cleveland halt in the field.

"We have encountered every sort of obstacle and have trenched through blue granite rock, sand rock, shale, stumps, on flat land and hilly, through all types of weather. Our Clevelands have been economical to operate, easy to maintain mechanically, adaptable to every terrain and simple to handle."



There's nothing like a Cleveland for trenching . . . accurate . . . fast . . . dependable . . . clean.

The CLEVELAND TRENCHER Co.

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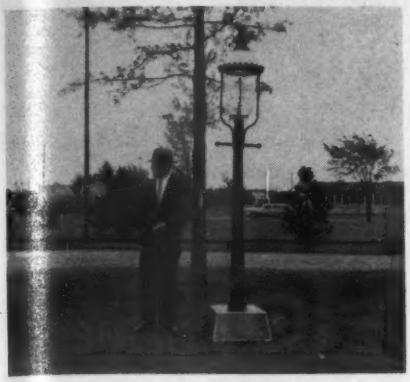
Good Everywhere ®

Superior Water Light & Power Company, Superior Wisconsin, is nearing completion on a project involving the installation of 2000 ft of 10-in. low pressure main in Superior. Estimated cost of the project is $16,000. All work is being done by company forces.

Delaware Power and Light Company, Wilmington, Delaware, has scheduled for its 1958 program, construction of new facilities to cost approximately $1,279,300. Included in the program are installation of 122,300 ft of 2 to 8-in. high and low pressure main extensions, along with services, house regulators and meters, to supply new customers in Wilmington and northern New Castle County, Delaware. Work in the area will also include installation of 27,700 ft of 2 to 12-in. replacement mains, services, meters, and house regulators, along with replacements and new work in advance of paving, and system reinforcement, both high and low pressure. All work in above two categories to be performed by company forces. Along Naamans Road, New Castle County, company is installing 18,500 ft of 12-in. high pressure feeder main from city gate station to increase capacity, strengthen system, and increase security; contractor on job is Henkels and McCoy. Along Chestnut Hill Road, Newark, Delaware, company plans to install in late summer 9800 ft of 8-in. high pressure line connecting new source of supply of natural gas to south end of its system.

Gas Department, City of Long Beach, California, has underway or near completion work on several projects, including installation of some 29,000 ft of 16-in. intermediate pressure distribution main at Huntington Beach, Orange County, at a cost of approximately $300,000, with work contracted by Ernest C. Collins Company; installation of some 26,000 ft of 12 and 16-in. intermediate pressure main in Long Beach, at an approximate cost of $250,000, with work contracted by Graven and Company; and work on a 10-acre gas storage plant and compressor station site, comprised of furnishing and placing fill, costing approximately $80,000, contracted by L. S. Hawley Company. Work underway or soon to begin includes erection of a 5,000,000 cu ft gas holder with foundation, costing approximately $1,326,000, contracted by General American Transportation Company; installation of approximately 26,000 ft of 16-in. intermediate pressure mains in Long Beach at an estimated cost of $250,000, not yet contracted, and engineering design contract for a new compressor station in conjunction with the new 5,000,000 cu ft gas holder, contracted by M. A. Nishkian and Company.



Commemorating 110 years since the formation of Rochester Gas Light Company — early-day predecessor of the Rochester Gas & Electric Corporation — Robert E. Ginna, chairman of the board and chief executive officer of the company, lighted and placed in service a 19th century gas street lamp. This lamp is installed in front of the employee center alongside the Edison Bi-polar generator of the same era. Shown standing next to the gas street lamp is Ernest J. Howe, president of the company.

Ladish Company has opened a new manufacturing plant, sales service office, and warehousing facilities in Houston. The plant will operate as Ladish Company Texas Division and serve the Gulf Coast, Mid-Continent and Southwest areas with pipe fittings, corrosion resistant valves, saw blades, drop forgings and rolled rings.

Gas Range Locks Up. Sunray Stove Company of Delaware, Ohio, has developed a safety device that prevents children and older adults from turning on the gas range accidentally. It governs the range in much the same way an ignition key controls operation of the family car. When locked with the Saf-Tee-Kee, no one can turn on the range's gas supply, regardless of which valve may be accidentally turned on. This is another unusual feature offered by the stove manufacturer who introduced the world's first remote control, push-button gas range earlier this year.

Union Gas Company of Canada, Limited, has completed transfer of recently-acquired Dominion Natural Gas Company holdings to its operations. As a result of the transfer, Union will now serve the following principal Dominion markets: Kingsville, Leamington, St. Thomas, Ingersoll, Woodstock, Paris, Galt, Preston, Hespeler, Brantford, Tillsonburg, Delhi, Simcoe, and Dunnville. Union Gas will also begin serving a large number of smaller Dominion markets.

American Gas Association has announced a second annual competition to recognize outstanding public relations achievements in the gas industry. A trophy will be awarded this year to the company making the year's outstanding accomplishment in solving a specific public relations problem and contributing to the development of better public opinion and understanding of the company, gas service, or of the gas industry as a whole. Southern California Gas Company won last year's competition over 32 other entries.

In Jacksonville, Florida, former executives of Bryant Manufacturing Company and Carrier Corporation — H. L. Clary and R. G. McElwain — have formed a supplier company to be known as McElwain, Clary, Incorporated. The new company will handle lines of air conditioning and heating equipment and supplies including those products of Hart & Cooley, American Blower, Metalbestos, Safti-Vent, etc. It will also have the North Florida-South Georgia distributorship of Bryant products.

Cutler-Hammer, Inc., has expanded into the field of electronics with acquisition of Airborne Instruments Laboratory Inc. of Mineola, New York. Under terms of the agreement, each share of outstanding stock of Airborne Instruments Laboratory is being exchanged for one share of Cutler Hammer, retaining its name, officers, management, personnel, and line of business. AIL specializes in the application of electronics to radar, microwave, data-processing equipment, design, and production of systems, etc.

Pennsylvania Gas Association, celebrating its 50th anniversary, has elected the following officers for the coming anniversary year: C. M. Swan, president, Pennsylvania Gas Management Company, as president of the association; W. C. Pierson, general superintendent gas operations, Philadelphia Electric Company, as first vice president; E. H. Smoker, president of The United Gas Improvement Company, as second vice president; L. B. Richards, vice president The United Gas Improvement Company, third vice president; J. A. Schultz division accounting manager, The United Gas Improvement Company as secretary and treasurer. Shown left to right in the photo are: F. H. Lichtenwalter, managing director PGA; L. B. Richards; J. A. Schultz (back row); W. C. Pierson, C. M. Swan, E. H. Smoker (front row).

Louis J. Wagner, manager of the sales engineering bureau of Consolidated Edison, has been elected chairman of the Metropolitan Gas Heating and Air Conditioning Council which meets monthly at the AGA headquarters in New York City to discuss ideas, methods, and problems relating to the management of gas heating and air conditioning sales. Wagner, who was previously vice chairman and secretary-treasurer of the group, took office in June.

Florida-Georgia Gas Association has elected Walter T. Napier of Jacksonville Gas Corporation as chairman of the association. L. A. Friederich of Peoples Gas System in Tampa was re-elected secretary-treasurer.

Kansas Power and Light Company's employee magazine, "Service," has been rated among the top 20 percent of the nation's industrial publications in a recent evaluation by the International Council of Industrial Editors. By being rated among the top 20 percent, "Service" will have the opportunity to compete with other top industrial publications in its category for a first award, award of excellence or certificate of merit in the ICIE Awards competition. Awards will be announced at the ICIE Convention in June.

Ad Award to M-F. Massey-Ferguson Industrial Division has received the gold award for a 12-ad campaign promoting its backhoes and loaders from the National Federation of Advertising Agencies. The award is accepted by A. A. Thornbrough, president of Massey-Ferguson, Ltd. (center). At the left is Preston D. Huston, director of the campaign in business and industrial magazines, and president of Associated Advertising Agency. At the right is C. J. Davis, general manager of Massey-Ferguson Industrial Division. Ads from the "gold award" campaign currently appear in American Gas Journal.

Men At Work

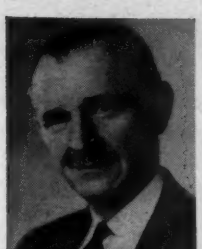
IN THE GAS DISTRIBUTION INDUSTRY

● **Col. Walter J. Riley, Clarence W. Bader,** and **Rollin M. Schahfer** have been re-elected directors of Northern Indiana Public Service Company for a three-year term. Riley is chairman of the board of the First National Bank and Union National Bank of East Chicago, Bader is president of the Bader Corporation in Gary, and Schahfer is vice president of Northern Indiana's engineering and electric operations.

● **Albert J. Klemmer** has been elected auditor for Rochester Gas and Electric Corporation.

● **Russell H. Williams** has been elected vice president in charge of public relations of Public Service Electric and Gas Company of Newark, New Jersey. He succeeds **Robert A. Zachary** who retired recently after more than 28 years in public relations work with the company.

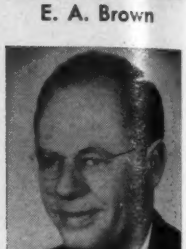
● Philadelphia Electric has announced the appointment of **W. C. Piersen** as general superintendent of gas operations. He was formerly general superintendent in charge of gas transmission and distribution. **J. W. Carroll** succeeds him in this post.



L. G. James

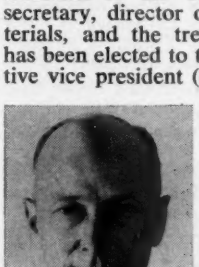
E. A. Brown

W. G. Wiegel



T. S. Bacon

● Lone Star Gas Company has announced the appointment of two new executive vice presidents, three new vice presidents and a new comptroller. **Louis G. James,** vice president and comptroller, has been elected to the new position of executive vice president (finance and accounting). He will be chief financial officer of the company and provide general direction to the comptroller, corporate secretary, director of purchases and materials, and the treasurer. **E. A. Brown** has been elected to the new post of executive vice president (operations). Formerly



C. M. Hill

H. J. Yonkers

vice president in charge of exploration and gas supply, Brown will be in overall executive charge of operations and will provide general direction to the vice presidents in charge of distribution, transmission, and exploration and gas supply. **Willard G. Wiegel,** treasurer and director of personnel, has been elected to the new position of vice president (personnel). He will continue also as treasurer. The new post of vice president (research and development), was given to **Thomas S. Bacon. Carl M. Hill** has been elected vice president (exploration and gas supply) the position formerly filled by Brown. **Howard J. Yonkers,** assistant comptroller, has been elected comptroller to succeed James in that capacity.

● **Fred A. Hubbard** has been appointed general superintendent of the New Bedford Gas and Edison Light Company.

● Peoples Natural Gas Company of Pittsburgh has announced the following personnel changes: **George K. Kline** has been advanced to assistant to the general superintendent; **Jack B. Livingston** has been appointed planning engineer for the company, and **Paul E. Smith** has been appointed assistant manager of the Glenshaw service area.

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NRT-8010 SERIES

New House Service Regulator

NEW ALUMINUM BODY AND TOP
CAST IRON INLET UNIT
V-TYPE STAINLESS STEEL BAND

ONLY ONE STAINLESS SCREW with nut to remove for complete orifice and valve pocket. Permits exchange of diaphragm case without removing inlet unit from line.

Supplied as:

1. No seal type
2. No seal type with automatic cutoff
3. Internal diaphragm operated relief valve for complete over pressure protection
4. Internal diaphagm relief and automatic cutoff

REYNOLDS
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Bulletin Board

NEW BOOKS...BROCHURES...CATALOGS

For more information on items described here in brief, use the handy reply card and circle the corresponding numbers

First Gas Venting Film. First color slide film to deal exclusively with venting of gas appliances has been produced and released by the Metalbestos Division, William Wallace Company, for showings to heating dealers, distributors, utilities, and code authorities. Film has a running time of 27 minutes. Entitled "Heat in Harness: The Story of Gas Venting," it covers popular misconceptions concerning gas venting, scientific advances in the field, and the contribution of correct gas venting to total gas heat comfort. Arrangements for showings of film can be made through Metalbestos salesmen. *Metalbestos Division, William Wallace Company.*

CIRCLE (87) ON THE REPLY CARD

Utility Tractors. Trenching, loading, and dozing machines — complete ready-for-work units mounted on Case 34 and 42 hp utility tractors — are described and illustrated in eight new free publications. A 6-page leaflet shows company's line of wheel and crawler tractors, companion Case-built backhoes, front-end loaders and dozer blades, plus a large selection of specialized attachments. In addition, six new 2-page specification sheets spotlight major operating features and mechanical details of individual tractor-equipment combinations. A seventh 2-pager describes a 5-ton tilt-trailer. *J. I. Case Company.*

CIRCLE (88) ON THE REPLY CARD

Odorization. New 2-page bulletin, "Odorizing Natural Gas," features use of the McCannameter — a packless proportioning pump — as the heart of odorizing systems. Typical requirements of an odorant pump are listed and schematics for integrated systems (both electrical and pneumatic) are shown. Pump capacities and materials of construction are also included. *Hills-McCanna Company.*

CIRCLE (89) ON THE REPLY CARD

Venting. New brochure on venting has been published by the Gas Vent and Chimney Division of Gas Appliance Manufacturers Association. Titled, "Modern Heating Demands Modern Venting," the new publication details functions of the Type B gas vent and the factory built chimney. How established efficiency of gas heating can be enhanced with vents or chimneys and how substantial building economies can be effected are pointed out in the brochure. Both the Type B vent and the factory built chimney are listed by Underwriters' Laboratories. Type B vents are made to handle low temperature flue gases produced by most gas-burning appliances, while factory built chimneys also take care of higher temperature waste gases produced by other appliances including those that burn liquids or solids. *Gas Appliance Manufacturers Association.*

CIRCLE (90) ON THE REPLY CARD

Invisible Scrub Brush. New 24-page fact book on ultrasonic cleaning explains practical applications and basic principles of this modern cleaning method, as well as the design of equipment. Areas in which ultrasonic cleaning is advantageous include cleaning of gas meter cases, meter parts, regulator bodies, etc. Thoroughness of soil removal and the ability to clean without disassembly are the main features of this new method. The booklet is divided into several sections with design information, occupying a large portion of the booklet. Under general system considerations, batch immersion, conveyor, and multi-stage systems are discussed, along with various transducer arrangements. Information on solutions and chemicals recommended for ultrasonic cleaning is also included. The section on cleaning principles explains how ultrasonic energy creates "cavitation" in the liquid, that is, the rapid generation and sudden, violent collapse of very small bubbles throughout the solution. These bubbles act like thousands of invisible scrub brushes at all surfaces in contact with the liquid. Last part of the booklet lists requirements and specifications of ultra-sonic generators and transducers, and supplies data on the many types of ultrasonic equipment, parts, and accessories. *Branson Ultrasonic Corporation.*

CIRCLE (91) ON THE REPLY CARD

Auxiliary Electric Power. How various gas distribution companies use auxiliary electric power plants to maintain electrical service continuity during interruptions of commercial service is outlined in a new bulletin available from D. W. Onan & Sons, Inc. Described in the brochure are package installations for service trucks, standby power for mobile radio at service dispatch centers, standby for instruments and controls at several gas distribution companies, plus other unique installations. *D. W. Onan & Sons, Inc.*

CIRCLE (92) ON THE REPLY CARD

Gas Purifiers. New line of Hi-eF purifiers, scrubbers, mist extractors, and separators for the gas industry is described in bulletin just published by V. D. Anderson Company. Four types of scrubbers are cataloged: Type L for light liquid loads; Type LG for heavy liquid loads; and Type LD and LDW, dust type scrubbers, recommended for use in natural gas pipelines wherever an exceptionally high degree of dust recovery is required. Dimensions, cutaway drawings showing operational flow, pressures, and other buying and specifying information are presented. A selection table for accurate sizing of scrubbers is also included. Unit advantages include maintenance-free design which does not employ filters or screens; compactness; and written guarantee of performance. *The V. D. Anderson Company.*

CIRCLE (93) ON THE REPLY CARD

Incinerators. Specification sheets describing three recent additions to the Waste King indoor incinerator line are now available. Contain complete specification data, photographs, and cutaway drawings covering the newly-introduced smokeless, odorless, deluxe 900 and custom 900 models. *Waste King Corporation.*

CIRCLE (94) ON THE REPLY CARD

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do it once — do it right!

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PAT. NO. 2408517

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Accuracy in cutting or beveling saddles, tees, els, or other designs has long been a time-consuming, trial-and-error process in pipe fabricating. Today, however, you can produce *precise* cuts and bevels *the first time*—with an H&M Shape Cutting Attachment!

The H&M Shape Cutter is actually steered around the guiding template by exerting the proper spring tension on the sliding torch assembly. The cutting torch is thereby *forced* to reproduce the exact shape desired.

Eliminate those costly "re-cuts" and "re-fits" with an H&M Shape Cutter. Then—do it once, and you've done it right!

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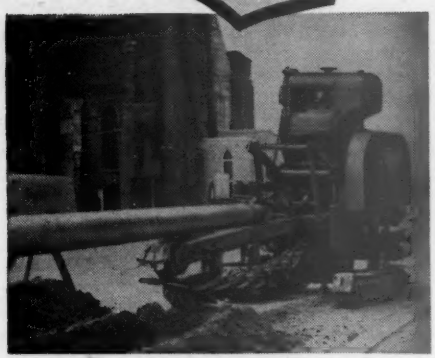
DIG MORE DIRT FOR LESS MONEY WITH A Pow-R-Ditcher



Model 4T Pow-R-Ditcher

Here's a real workhorse that digs for LESS because it costs so much LESS! Ideal for the light construction field in laying gas pipe, water and cable lines and digging home foundation footings. Very maneuverable for those "tight spots", the 4T is only 6' high, 13' long and 48" wide. Digs 6" to 14" wide and up to 17' per minute. Handles most small ditching jobs at a fraction of the cost of more expensive ditching machinery.

"Small W-2 Pow-R-Ditcher is Finest for Small Services"

. . . says Post and Lee Service of Alta, Iowa. "In one month we completed over 100 services (7100 feet). It was rugged work but the W-2 handled it with no breakdowns except a pair of belts. We keep ahead of schedule with the W-2." The W-2 digs 2½" to 4" wide and is ideal for gas service, electrical service and shallow water lines.

Write For Literature and Low Prices on the Complete Vermeer Pow-R-Ditcher Line

Larger Pow-R-Ditcher models also available. Check the performance, quality and price before you buy. Our nearby Vermeer dealer will be happy to arrange a demonstration.

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New Literature

Drafting Room Short Cuts. New booklet outlines short cuts and savings in reproduction departments, drafting rooms, and in the field possible with use of Kodagraph reproduction materials. Entitled, "Short Cuts and Savings with Kodagraph Reproduction Materials," the 12-page booklet diagrams seven applications including: Protecting original drawings; simplifying print distribution; restoring old and worn drawings; reproducing blue-prints and direct-process prints; speeding revision of drawings; permitting combination of standard designs and saving drafting time with photodrawings. *Eastman Kodak Company.*

CIRCLE (95) ON THE REPLY CARD

Indicating Controllers. New 16-page catalog describing the complete line of indicating controllers for automatic control of pressure or temperature; transmitters for pressure or temperature indication; receiver gages in various designs, ranges and degrees of accuracy, and sensitivity has been published by U. S. Gauge. Supercedes previous catalog for these instruments and includes newly added helical Bourdon tube pressure elements and the vapor-gas organic liquid temperature sensing systems. *United States Gauge.*

CIRCLE (96) ON THE REPLY CARD

I've got to give that new man credit — he keeps his mind on his work.

Pressure Regulators. New 28-page bulletin, "Pressure Regulators . . . and How to Select Them," has been issued by Kieley & Mueller, Inc., control valve manufacturers. Ten-page prefatory section spells out most important considerations for correct application of self-operating and pilot-type pressure regulators. Graphic tables are included so reader can make rapid comparisons of basic regulator characteristics without reference to detailed specifications given elsewhere in the booklet. Bulletin covers back-pressure and relief valves of spring-loaded and weight-loaded types, reducing valves, remote pilot-type and valve-mounted regulators, pump governors, steam-operated, packless, self-contained and differential regulators. *Kieley & Mueller, Inc.*

CIRCLE (97) ON THE REPLY CARD

Forced Air Gas Furnaces. Designed as an architects' and engineers' bulletin, new six-page catalog describes entire line of Clipper Imperial, Clipper, and Clipper Horizontal forced air gas furnaces. Barnes line of single, dual, and half dual gas floor furnaces is also included. Applications, features, ratings, and specifications are described in text and pictures. *Tamco Corporation.*

CIRCLE (98) ON THE REPLY CARD

Air Hoists. New 4-page manual on air hoists features illustrations and descriptions of the new Thor H-1000. Tables on rate of ascent and descent under various load conditions and air pressures are included. *Thor Power Tool Company.*

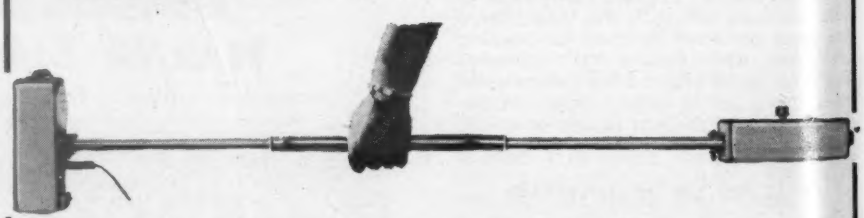
CIRCLE (99) ON THE REPLY CARD

Fire Protection. How a company can help protect itself against fire loss is explained in a new brochure, the "Fire Protection Service Plan," published by Ansul Chemical Company. The plan emphasizes need for fire fighting training and fire prevention planning and explains "plus" services available to users of Ansul equipment such as in-plant fire protection survey, visual aids for training meetings, fire control training and demonstration, and a fire school for supervisory personnel. *Ansul Chemical Company.*

CIRCLE (100) ON THE REPLY CARD

THE NEW MINIATURIZED WILKINSON Line Locator Model W-2

This radically new, powerful transistorized sub-surface locating instrument weighs only four pounds and is one-fourth the size of conventional pipe locators.



It is as handy as a flashlight; the maintenance is trivial; the non-leak miniature batteries last ten times longer. Transistors never require replacement. Molded glass fibre cases. Transistor ear set. Telescope aluminum handle. Etches circuitry and unique antenna.

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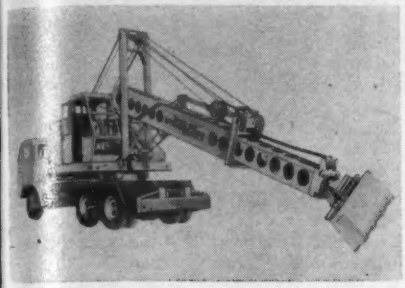
New Equipment

FOR THE GAS DISTRIBUTION INDUSTRY

For more information on items described here in brief, use the handy reply card and circle the corresponding numbers

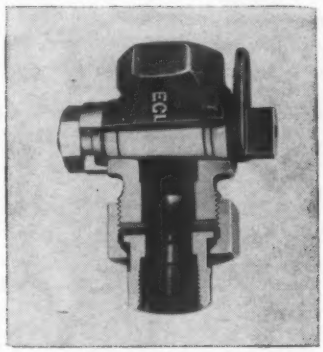


Grading, Digging Attachment. Utilo-Scope, a new hydraulically operated telescoping grading and digging attachment, has been announced by "Quick-Way" Truck Shovel Company. Utilo-Scope replaces "Chore-Master" attachment introduced by the company last year and incorporates a number of new improved features. Attachment makes possible wider range of jobs with the "Quick-Way" Model 125A Truck Crane, as the hydraulically operated boom will precision grade slopes and roadsides, rip pavement, dig under and around obstacles, clean ditches, and load trucks. Boom extends to a radius of 31 ft. Bucket or grading blade swivels from side to side and opens and closes with a wrist action. Attachment can be removed or installed on crane in one hour. *"Quick-Way" Truck Shovel Company.*

CIRCLE (33) ON THE REPLY CARD

Jaw-Action Bucket for Loader. M-B Corporation has in production a heavy duty truck loader with a versatile self-loading bucket that incorporates a hydraulically operated jaw. The jaw swings down and reaches out to meet ground level approximately 13 inches forward of the lip of the bucket. Completing its closing cycle, jaw pulls in and holds the "full load" bite in the ½-yd bucket. Powerful jaw action of the self-loading bucket eliminates necessity of ramming truck into a stockpile to obtain a full bucket. M-B loader is designed to fit almost all types of trucks, including 4-wheel drive units, cab-over, tilt cab, and conventional trucks without violating legal overall truck width restrictions. Heavy duty bucket capacity is ½ cu yd with larger buckets available for special jobs. *M-B Corporation.*

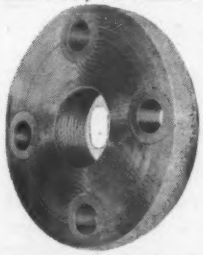
CIRCLE (34) ON THE REPLY CARD



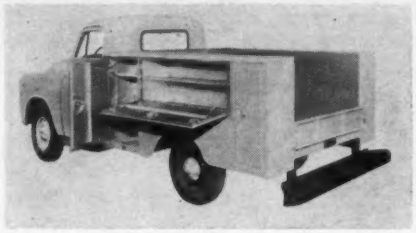
Insulated Gas Cocks. Eclipse has developed a new line of "Wedgeseal" gas cocks that incorporates an insulated union to combine shutoff with insulation against stray or induced house currents. Unit costs less than separate units and requires fewer threaded connections. Insulator is integral with tailpiece and is used in compression only. Insulating material is unaffected by manufactured, natural or LP gas, is weather-resistant, stable at temperatures up to 400 F and suitable for continuous operation at temperatures up to 275 F. *Gas Service Products Division, Eclipse Fuel Engineering Company.*

CIRCLE (35) ON THE REPLY CARD

Serrated-Face Flanges. Tube Turns Plastics Inc., has announced replacement of its existing line of smooth-face flanges with the industry's first complete line of flanges with concentric-serrated faces for polyvinyl chloride piping systems. Better gasket retention, more effective seal, and improved appearance are advantages cited for switchover from smooth-face to serrated-face flanges. Concentric serrations instead of the "phonograph record" type of spiral serrations, eliminates chance of fluid traveling around the spiral grooves between serrations and eventually leaking from the flange. With concentric serrations, fluid is sealed off at the first serration. *Tube Turns Plastics, Inc.*



CIRCLE (36) ON THE REPLY CARD



Service Bodies. New model service truck body has been announced by Morrison Steel Products, Inc. Features of the new model include paddle locks (patent pending) on all doors that are completely serviceable in the field using only pliers and combine one-hand operation with a safety-type catch that prevents a partly-closed door from opening accidentally. Locks are flush mounted for safety and appearance. *Morrison Steel Products, Inc.*

CIRCLE (37) ON THE REPLY CARD

Small Pipe Reamer. New ratchet pipe reamer, Toledo No. 182, made especially for small pipe, has a seven flute design that removes chips better and improves the unit's cutting qualities. Unit is designed for faster reaming and to eliminate gouging. Unit feeds into the pipe with only light pressure, is easily resharpened, and has a pipe capacity of ⅛ to 2-in. *The Toledo Pipe Threading Machine Company.*

CIRCLE (38) ON THE REPLY CARD

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Gracious Living with Decorative Gas Lighting

Flame or Mantle Type Available for All Gases

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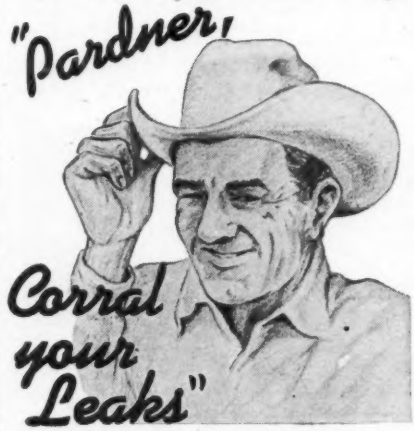

SCF consultants "Ride Fence" for gas companies, nationwide, locating and grading leaks by Vegetation Method, Safety or Combination surveys.

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A REGUATOR, BREATHER VENT AND CATHODIC INSULATOR IN ONE PACKAGED UNIT

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TYPE 51-R FOR EVERY INSTALLATION

EXCLUSIVE FEATURES NOT FOUND ELSEWHERE

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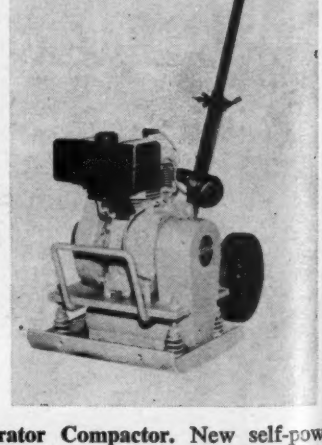
New Equipment

Remote Controlled Valve Drive. Fisher Governor Company in conjunction with its subsidiary, Control Specialty Corporation, has announced the remote controlled drive Type 600W "Kixcel" for mounting on the Type 4100 Wizard pilot. "Kixcel" is designed to meet the problem of distance between control valves in the gas industry. An electric signal actuates the "Kixcel," which changes the Wizard set point to meet new flow requirements, thereby freeing station personnel who then do not have to check each valve in the field personally. Unit can be operated on alternating current with conventional telemetering equipment or on direct current with a polarized signal. *Fisher Governor Company.*

CIRCLE (39) ON THE REPLY CARD

Chain Hoist. New 1000-lb air-operated chain hoist weighing only 30 lb that raises half-ton loads at a rate of 50 ft a min. has been announced by Thor Power Tool Company. Unit is powered by new reversible 8-blade air motor. Is capable of lowering rates up to 96 ft a min. under maximum load. *Thor Power Tool Company.*

CIRCLE (40) ON THE REPLY CARD



Vibrator Compactor. New self-powered vibratory compactor, the Powr-Pactor, has been announced by Maginniss Power Tool Company. Unit is designed for quick, convenient compaction and grading of stone, gravel, and granular soils around foundations, footings, abutments, and pipe lines, in sewer trenches, on bridge approaches and under concrete floor slabs. Equipped with rollers and water feed attachment, Powr-Pactor can provide compaction of blacktop on highway and city street repairs, around manholes, next to curbs, as well as on driveways, walks, and parking lots. With variable frequencies from 2400 to 7000 vpm and a compacting force up to 4000 lb, unit produces uniform Proctor densities on any job. *Maginniss Power Tool Company.*

CIRCLE (41) ON THE REPLY CARD